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GARDEN AND FOREST

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HORTICULTURE, LANDSCAPE ART AND FORESTRY

Conducted by

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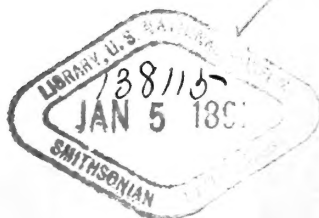
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Organized Protection for Parks.

THE proposal to seize a portion of Central Park as a site for some of the exhibition buildings of the World's Fair has been discussed in these columns more than once, but we refer to it again, because it is a matter of much more than local interest. As an admirable example of pastoral scenery in the heart of a great city, and as the first work with such a motive ever designed for such a situation, Central Park is in a sense a national possession and is regarded with pride by the entire country. At all events, the proposed invasion is a representative case, and as such should command the attention of all those who have an intelligent appreciation of the value of public parks in cities and who wish to protect them from encroachment and spoliation. The pressure of the expanding city is felt on every foot of the boundary of every open space in New York, and the most powerful interests are constantly pushing to gain a foothold for some special purpose on the land devoted to public use. This situation is repeated in each of our rapidly growing cities, and unless the resistance to these constant assaults is unrelenting and determined, we may expect to see many other urban parks share the fate of our own City Hall Park, and gradually disappear, or else become perverted to purposes foreign to their design and destructive of their highest usefulness.

It is not our purpose to repeat the reasons for preserving park areas, and especially for protecting those whose beauty and value will continue to increase for generations to come. But taking it for granted that a park is worth preserving, it should be remembered that it is only safe when public sentiment is intelligently and actively interested in its behalf. And since the attacking forces may be swift and strong, public opinion needs to be organized for expression and always ready in an emergency. It is known to every one who is familiar with the history of Central Park that the newspapers of the city have saved it from ruin more than once, when even its legally constituted custodians were eager to surrender it; and when the question of appropriating a portion of the park for the World's Fair was under discussion, the unanimity of the press, outside of the daily papers, was surprising. Journals in the special fields

of architecture, art and engineering, and the leading literary, pictorial and religious weeklies, with scarcely an exception, took a firm stand against the invasion. It may be that this aid can always be counted on; but the real danger comes when the sober sense of the community is prostrated before a sudden gust of enthusiasm for some dazzling enterprise, whose right to occupy and possess the park is insisted upon as superior to that of the people or of their descendants.

It is plainly the part of wisdom to make preparation for such emergencies, and one assurance of safety against these sudden assaults might be found in a permanent association organized for the special purpose of protecting the parks from injury. True, there is a Board of Commissioners whose official duty it is to care for them. But this Board may need the positive support of public opinion, just as the Park Department in this city requires support to-day; and the time may come when the authorized guardians of the parks are their most dangerous enemies. In either case a voluntary association of public-spirited citizens, whose names would command respect and who would look at every question affecting the parks from the people's side, and not from the point of view selected by some special interest, could not fail to exert a wholesome influence. Such an organization, with a permanent Secretary, and, when needed, a paid staff, would be prepared not only to give timely warning of coming danger, but to give opportunity for public opinion to find effective expression. An association in New York, for instance, charged with the duty, could have at Albany when the legislative session begins, protests against any change in the law forbidding exhibitions in Central Park, from the associated architects of the city, from the artists, the physicians, the clergymen, and from citizens of every calling. The sum of the matter is that all parks in our cities are exposed to attacks, which are the more dangerous because many of them come from combinations of worthy people, organized for worthy purposes. The ultimate safety of these pleasure-grounds can be assured only by an enlightened and alert public sentiment; whether some systematic plan for helping the public will to find expression is not needed now to meet well organized attacks against them is a question worth considering by the friends of public parks in all our cities.

The volume of the final reports of the tenth census, for which the largest demand has been made at the Department of the Interior, is the ninth, which is devoted to the forests and forest-resources of the United States, and the edition is now nearly exhausted. This fact seems to indicate that the American forests, which ten years ago created no real interest except among persons engaged actively in destroying them, have now become a matter of general concern with thoughtful persons in all classes of society. Ten years ago little was known, actually, of the extent or composition of our forests. The conditions essential to the distribution and development of our most valuable trees, and the character even of the material produced by many of them, had not been determined; and the productive capacity of the forests of the country, if any one thought about it at all, was considered inexhaustible. Now it is known where our forests are, at least, and how they are composed, what they produce and how long they may be expected to remain productive; and there is hardly a newspaper in the United States which does not contain, from time to time, valuable information about forests and forestry. Commissions have been appointed in a dozen states to collect and disseminate knowledge about forests, and the interest in the subject is increasing on all sides. This result has been brought about by the hard and untiring work of a few conscientious investigators. Their work has not been thrown away if it has prepared the way by this general dissemination of knowledge for the gradual introduction into the United States of systems of forest-management which, when they are adopted, will

relieve us from the stigma of standing alone among civilized nations in disregarding the value of the forest as the foundation of all permanent national prosperity.

If the forests of this country should perish, agriculture and the arts would perish with them. Material development would be arrested and poverty would replace prosperity from one end of the land to the other.

The Deciduous Cypress.

THE view of a Cypress-swamp in southern Indiana, which appears upon page 7 of this issue, will serve to give an idea of the appearance of the Deciduous Cypress as it is found growing toward the northern limits of its distribution, where it does not attain to the vast size which characterizes this tree further south, and especially in Mexico. But in Indiana, even the Cypress, if not as large as it is often seen south of the Ohio River, is still a tree of respectable size; and Mr. Robert Ridgway, of the Smithsonian Institution, who has sent us the photograph from which our illustration has been made, has measured trees in the swamps near the mouth of White River nearly 150 feet high, and trunks eight feet through above their swollen and buttressed bases. Trunks twelve or fourteen feet through have been seen in the southern States; and a few years ago it was not difficult to find them ten feet in diameter in the great swamps bordering the lower Mississippi and some of the other rivers of the Gulf States.

The Deciduous Cypress first appears in the Atlantic States in the lower portion of Delaware; thence it extends, generally near the coast, to southern Florida and through the Gulf States and the Valley of the Mississippi to the banks of the lower Ohio. This species, or a related one hardly to be distinguished from it, reaches far south into Mexico, where it attains enormous size and an individual existence lasting through centuries.

The Cypress in the United States grows always in water or on low, flat land adjacent to rivers or great shallow lakes, often covered with water during weeks or months at a time. That part of the trunk which is covered with water, or which is liable to be, is greatly enlarged and strengthened by huge, often hollow, buttresses, which project out in all directions. Each of these buttresses terminates in a large branching root, which extends out to a great distance, sending down stout anchor-roots deep into the ground, and with many lateral roots, from which spring the "knees" peculiar to this tree. The trunk, covered with furrowed, dark red bark, shoots up perfectly straight from its enlarged base, forming a tapering column eighty or ninety feet high, when it divides into a number of long, stout, horizontal branches, which form the wide, flat top, which is hung generally with the long stems of the Southern Moss (*Tillandsia usneoides*). Naturalists have puzzled over the Cypress knees and the purpose of this development, almost ever since the tree was discovered; and they have formed the subject of many essays. The knees first appear, often close together, as small tubercles on the upper side of the roots. They grow rapidly until they attain a height of from two to ten feet, or have pushed well above the water-level, when they cease growing upward, and increase in diameter. The upward growth is very rapid, and the bark covering the growing top is soft and spongy. There are various facts which seem to indicate that the service which these peculiar growths perform for the tree is to bring air to the roots, otherwise cut off by the water which covers them during a considerable portion of the year, from all connection with the atmosphere. This is the view of Professor N. S. Shaler, who has made a careful study of this tree, and who finds "that it is not unreasonable to conjecture that this function of the knees is in some way connected with the aëration of the sap."* His facts are "the failure of the knees to develop when the trees have grown on high ground; the development of the knees above the permanent water-level, and to a height varying with that level; and finally, the destruction of the trees whenever the level of permanent water rises above the top of the knees."† These views are confirmed by a more recent paper,‡ published by Mr. W. P. Wilson, in the Proceedings of the Philadelphia Academy, in which it is shown that other plants besides the Cypress, which grow habitually with roots covered with water—the Water Gum (*Nyssa silvatica*, var. *aquatica*), *Avicennia nitida* and *Pinus serotina*—develop similar root-processes; and what is still more suggestive, Mr.

Wilson has induced plants of Indian Corn to send roots above the surface of the soil by keeping it continually saturated with water.

There is another point, and an important one, in the life history of our Cypress, which has never been satisfactorily explained. The great masses of this tree and the largest individuals are found in swamps or in shallow ponds, which are never dry except during periods of exceptional drought, and where the water is several feet deep at the time the seed would germinate. How did these great trees begin their existence, which may have extended through centuries, and how did the seed from which they spring find an inch of dry ground to attach itself to? The evidence points to a larger quantity of water in all our rivers and swamps five hundred or a thousand years ago than at present, and it is certainly improbable that the great swamps of the southern states could have been dry at any time during the period that the Cypress has occupied its present territory. Seedlings do not now appear among the old trees growing in the wet swamps and ponds, and they are only found on the margins of swamps in comparatively dry ground. Professor Shaler's hypothesis that the great trees in deep water have grown from branches blown down from neighboring trees, and rooted in the mud, is hardly consistent with the manner of growth of coniferous trees, and some other solution of this phenomenon must be sought for.

The vast size and beauty of this tree, the great age to which it attains, the peculiarities of its growth, the value of the material which it supplies to man, and its commercial importance, are not more interesting than its history. Like its near relatives, the California Sequoias, *Taxodium*, represented now only by our southern tree of comparatively restricted range, and by a very similar species in China (*Glyptostrobus* or *Taxodium Sinense*), once played a much more important part in covering the surface of the northern hemisphere than it does in these days. For in latest tertiary times just preceding the glaciation of the northern hemisphere, our *Taxodium*, with Sequoias and various Ginkgos, grew in Greenland and in Spitzbergen, and then was widely spread through North America and Europe, where grew, too, a *Glyptostrobus* almost identical with the existing Chinese tree. The coming of the ice drove all these trees out of Europe entirely, and forced *Taxodium* into what is now our southern states, and on to the highlands of Mexico, where the survivors of this once mighty race, barely altered by their new environments, now find their only abiding place.

The Art of Gardening—An Historical Sketch.

XVI.—Mediæval Europe.

WHEN barbarian hordes from beyond the Rhine began to spread over the lands where Rome had ruled, first the isolated country-seat and then the suburban villa was abandoned, all classes seeking refuge within the walls of towns. Once deprived of constant skillful attention, the gardens of the Romans gradually decayed. "The walks were overgrown first with grass, then with bushes and then with forest trees, and on the former beds and playgrounds the shepherd pastured his flocks."* Yet we must not think of the ruin as immediate or complete. Even a Goth or a Vandal could appreciate the charms of an Italian country home, if he lacked the power to preserve them in perfection. We read of Theodoric restoring and improving the imperial gardens at Ravenna, and of Totila (strange conjunction!) inhabiting Hadrian's villa at Tivoli; and a story is told of some Christianized Goth who diversified his clipped Box-trees by causing some of them to be cut into the shape of the cross. When, in the sixth century, the troops of Belisarius entered Grasse, about fifty miles from Carthage, they found a palace of the Vandal kings and countless villas, surrounded by gardens "which might deserve the Persian name of Paradise," and which Procopius declared were finer than any he had seen in the East or the West.† Of course they were an inheritance from the Roman colonists whom the Vandals had dispossessed three centuries before. Even at the dawn of the Renaissance there were traces of ancient gardens still to be found in various parts of Italy and southern France which, together with the descriptions that Pliny and others had bequeathed, greatly influenced the re-birth of the art of ornamental gardening.

In the north, however, Roman relics perished more quickly and there was small effort made to replace them. Almost the only gardeners of the early mediæval world were the monks, who, within the walls of their great establishments, cultivated

* Notes on *Taxodium distichum* in *Men. Mus. Comparative Zoölogy*, xvi., Nos. 1 and 2.

† The Production of Aërating Organs on the Roots of Swamp and other Plants, *Proc. Acad. Nat. Sci. Phil.*, April 2d, 1889.

* Jaeger: "Gartenkunst und Gaerten."

† Gibbon: "Decline and Fall of the Roman Empire;" chap. xli.

fruit-trees and trellised vines on an extensive scale, had flower gardens with intersecting walks and rectangular beds, and brought the water they needed in canals of masonry or wood.* Sometimes a special part of the monastic garden was set apart for medicinal herbs, and here we see the germ of the scientific botanical collections of later days. The Benedictines were particularly devoted to all works of cultivation, and even into England, where the heathen Angles and Saxons had obliterated even the memory of the horticulturist from imperial Rome, these new emissaries of the now papal city soon brought again a knowledge of useful plants and flowers.

The mediæval burgher had at first but little chance to develop a love for gardens, yet as soon as he attained to any degree of comfort—in the twelfth and thirteenth centuries—his house usually had a small garden in the rear. The noble, during the more unsettled centuries when he was forced to be constantly on the watch for enemies, perched on a hill-top or sequestered in an inaccessible glen, had no garden except his court-yard, where, in Germany at least, a great Oak or Linden usually rose among the little flower-beds. The crusades introduced him to some acquaintance with exotic plants, and then Oleanders, Pomegranates and other ornamental shrubs in pots often stood beside his door. In France the late-mediæval chateau always had a garden with a turfed lawn, vine-clad arbors, parterres chiefly filled with Roses, an orchard, a vineyard and a fountain if possible.† In England, a writer of the twelfth century, Alexander Neckham, describing a baronial garden, corroborates the belief that “at the outset it corresponded to our kitchen-garden,” yet suggests “a certain share of taste in arranging the herbs, plants and fruit-trees.”‡ When Fitzstephen’s “Chronicle” says of London, at the same period: “Adjoining to the buildings of that city all round lie the gardens of the citizens who dwell in the suburbs, which are well furnished with trees, are spacious and beautiful,” we can understand nothing more than kitchen-gardens; and even these must have been devoted chiefly to fruits, tubers and herbs, for scarcely any green vegetables were consumed in England before the time of Henry VIII.

Even kings and princes long lived between walls, and prided themselves upon gardens which to-day would seem ludicrously small and poor. They make a great feature in the writings of the time, but seldom were more than walled enclosures, with clipped trees forming arbors and connecting covered walks, a fountain or canal, formal flower-beds, and stiff little shrubberies. Childebart, in the sixth century, laid out a Rose-garden for his wife in Paris, probably near the present Hotel de Cluny, where the ruins of Roman baths still remain,§ built terraces and grafted his fruit-trees with his own hand. Charlemagne is considered the first real patron of horticulture, and full lists are still extant of the plants with which he adorned his palace-gardens at Ingelheim and Aix-la-Chapelle. But it is impossible to gain an idea of his work considered from the point of view of art, nor can we discover just what was the aspect of the place in the great Dominican convent at Cologne, where, centuries later (in the month of January, 1247), Albertus Magnus entertained the King of Holland “in pleasant warmth amid fruit-trees and blossoming plants.”¶ Some sort of forcing-house is, of course, implied, and therefore the great schoolman is often cited as the restorer of the long-forgotten art of cultivation under glass. Indeed, his skill in this direction is said to have been one of the reasons why he was accused of witchcraft.

In this same thirteenth century St. Louis laid out the end of an island in the Seine at Paris as a garden; and Frederick II. of Germany, wishing to reproduce the delights of his Sicilian home, constructed a garden at Nuremberg which was compared to the hanging-gardens of Babylon because it had terraces supported by arches. Another Parisian garden, large for the time, lay between the Louvre and the church of St. Germain des Prés.|| But more remarkable was the garden of the Hotel St. Paul, which covered twenty *arpents* of ground, and which Charles V. filled with all manner of living curiosities, especially prizing his cages of parrots. A labyrinth of clipped trees was its chief feature, but when Paris fell into the

hands of the English this was removed by the Duke of Bedford, and the spot planted with Elms. In all descriptions of similar spots we read of cages for animals, aviaries, fish-ponds and arbors, which by their names recall the features of a Roman villa-garden, but were very different in size and artistic value. How small and simple were the finest of the early northern pleasure-grounds may be read in the enthusiasm of the Crusaders over every garden which they saw in Asia, or even in the south of Europe. Nor did later centuries improve upon them much until the Italian Renaissance spread its influence over the whole of Europe. Even in the fifteenth century, a garden which Philip the Good, of Burgundy, laid out at Hesdin, in Flanders, gained its fame from the puerile surprises and mechanical toys with which it delighted the fantastic taste of the time. Of course, however, shade-trees as well as the features already mentioned were always prized, and an old historian mentions the pleasure he felt at seeing 5,913 Elms brought with their roots by water to Paris.* The early kings of France had country-houses in the vicinity of their capital, but sought them for the pleasures of the chase, not of the garden.

The true successors of the Roman artists during the mediæval period were first, the builders of the new Rome which rose beside the Bosphorus, and then the Moslem conquerors who, between the seventh and the fourteenth centuries, spread themselves over so vast a portion of the Mediterranean lands.

Constantine and his immediate successors imitated in their capital not only the buildings but the pleasure-grounds which they had left beside the Tiber, and Justinian, in the sixth century, greatly improved upon their work. Many of the twenty-five churches which he built in the city and its suburbs were placed amid beautiful groves, and on the Asiatic shore, near Chalcedon, he laid out splendid gardens around the summer residence of Theodora, which were praised by the poets of the age for “their rare alliance of nature and art.”†

By the ninth century generations of luxurious emperors had given the great palace at Constantinople a size, a splendor and a variety which the occidental imagination can hardly realize. Constantine Porphyrogenitus himself wrote a description of it. We cannot restore its arrangement from his words, but we learn that it was a vast aggregate of buildings and gardens with colonnades, avenues, fountains, basins and parterres; that one garden, laid out in terraces, overlooked a great race-course; and that another, the central feature of which was the famous banqueting-hall called the “Chrysotriclinium,” contained seven peristyles and eight court-yards planted with Plane-trees.

M. G. Van Rensselaer.

New York.

Holiday Notes in Southern France and Northern Italy.—IX.

IT is a difficult task to write an account of such a garden as that of Mr. Hanbury. I find a pocketbook half full of notes taken there, and I have been making selections from these and again going through these selections a second or third time in order to keep my account within reasonable bounds. Readers may form some idea of the extent of the collections at La Mortola when it is stated that the “Alphabetical Catalogue of Plants growing in the open air in the garden of Thomas Hanbury, F.L.S.,” occupies sixty quarto pages; at the end of this catalogue the plants are arranged geographically—that is to say, alphabetically under each country. A mere glance through this portion shows at once how much each part of the world contributes to the gardens of the Palazzo Orenco. A Systematic Catalogue—published like the last in 1889—has the plants arranged in families, and so without trouble the relative importance—in numbers—of the various natural orders can be readily ascertained. Both lists give, after name of plant, references to either descriptions or figure, the time of flowering at La Mortola and the native country of the species.

Winter or early spring is the best time to see this garden; then, I have no doubt, the words of Mr. Hanbury’s gardeners, Signori Villa and Verri—both men who not only know plants, but love them—would be doubly true. Whilst wandering from one surprise to another my companion and myself frequently expressed our astonishment and admiration, until at last our courteous conductors remarked, “At this season the place is not such great things, but come in winter or spring and you would at once call it an earthly paradise.” In its issue of February 20th, 1886, the *Gardeners’ Chronicle* contains a list of plants in flower on February 2d at La Mortola; the list contained the names of upward of five hundred species.

* Sauval, quoted by André: “L’art des Jardins.”

† Gibbon.

* Viollet-le-Duc. “Dictionnaire de l’architecture.—Jardins.”

† Viollet-le-Duc.

‡ W. C. Hazlitt: “Gleanings in Old Garden Literature.”

§ André: “L’art des Jardins.”

¶ August Demmin, in “Studien ueber die bildende Kuenste und Kunsthandwerke,” says that the banqueting-hall was encircled by fruit-trees, that the tables were decorated with Roses, and Almond and Vine-branches, and that a Vine-arbor spread above the seat of the King.

|| In Alphand’s “L’art des Jardins” there is a picture taken from a fourteenth-century tapestry, which represents the regular rows of trees with which this garden was planted, and a parterre in which intricate patterns were constructed with low clipped Box-hedges.

A few data summarized from the catalogues mentioned will give some idea of the extent and interest of Mr. Hanbury's collections. There are fifty-one Agaves, sixty-nine Opuntias, thirty-nine Cereus, as many Mamillarias, forty Aloes, twenty-seven Stapelias and nearly a hundred Mesembryanthemums. To go on counting would be a somewhat tedious task for the writer, and the results of his efforts, if published to any extent, would probably prove as tedious to the readers of GARDEN AND FOREST; I therefore drop statistics with the remark that Acacia occupies a page and a half and Solanum nearly a page of the catalogue.

Of course all the Palms mentioned in previous series of notes, and many others besides, are to be seen at La Mortola, but the general collections of plants are too vast to allow space for large masses of each species. The most attractive member of the genus Phoenix—I am speaking of those cultivated in the open ground along the Riviera—is *P. Canariensis*; it is a quick grower, and is now grown in enormous numbers. Instead of having somewhat scattered glaucous pinnæ and rather stiff habit like the common Date Palm, it has more numerous glossy bright green pinnæ and a graceful habit. There seems to have been some doubt always as to the origin of this species until Dr. Christ, of Basle, who studied some year or two ago the flora of the Canary Islands on the spot, found localities in which truly wild colonies of the Phoenix were growing; other evidence of an historical nature collected by Dr. Christ, and his companion, Dr. Bolle, furnishes additional proof that this handsome Palm is really a native of the Canary Islands. Altogether forty-four Palm-names figure in Mr. Hanbury's catalogue—some of these, however, will have to be reduced when the plants flower and fruit.

I select a small proportion of the plants in flower at the time of our visit: *Tecoma stans* and *T. capensis*, the former with yellow, the latter with scarlet flowers—both splendid bushes. *Carica Cundinamarcensis* was both in flower and fruit. *Statice rosea*, a south African plant with charming, rose colored blossoms, was represented by a big, dense bush clothed with flowers; under cultivation in England it is rarely satisfactory. *Russelia juncea* and *Plumbago Capensis* gave an abundance of blossom, and in one or two spots the splendid blue trumpets of *Ipomœa Learii* formed quite a dazzling sheet of color; never under glass in England had my companion or myself seen this climber to such advantage. *Correa cardinalis*, the most beautiful member of this Australian genus, was noted as especially attractive; not far from it another Australian plant, *Pimelea decussata*, was also in flower. *Lochroma Fendlerianum*, with purple blossoms; *I. coccineum*, with scarlet ones, and the Humming-bird's Trumpet, *Zauschneria Californica*, made an attractive trio. The huge, white flowers of *Cereus Napoleonis* were especially striking, and on a "pergola," or walk with a sort of flat, trellised roof clothed with a bewildering array of climbers *Passiflora Decaisneana*, with its large, handsome flowers—in form and color not unlike those of *P. alata* and *P. quadrangularis*—was very conspicuous. On the low stone wall on one side of this walk numerous species of Begonia, *Æschynanthus*, many Bromelias—some of these in flower—*Cypripedium insigne*, etc., flourished in the shade.

Mr. Hanbury has paid special attention to economic, particularly medicinal, plants. As most of these, however, are not of value from an ornamental standpoint, I pass them over. A large collection of Orange-trees, etc., gathered together from all parts of the world where Oranges are cultivated, affords means for studying and comparing the various forms of this puzzling family which do not occur in every country. A large bush or small tree of the curious Chilian *Quillaja Saponaria* was laden with its woody carpels, which, at first sight, by no means recall the order Rosaceæ, to which the plant belongs. The thick bark is rich in saponin, which can be procured from it purer and more plentifully than from any other source; up to the present the principal use has been in washing and cleansing fine stuffs and tissues; but recently, however, the discovery of the action of saponin or a decoction or infusion of Quillaja bark on hydrocarbon oils, has opened out great possibilities for its use. Such extremely inflammable oils as benzoline—the dangerous character of which rendered the utmost care necessary in packing, carrying, etc.—can now be solidified and shipped with little danger or trouble—the liquid condition being readily restored on arrival by the addition of a small quantity of citric acid.

A covered way clothed with *Ephedra altissima*, a member of the order Gnetaceæ, a family nearly allied to the conifers, was gay with the numberless coral-red fruits which weighed down the green, leafless, twiggy branches. Probably the Kaffir Plum or Kei Apple, of south Africa, fruited for the first time

in Europe in Mr. Hanbury's garden some years ago. At the time of our visit the tree was laden with its yellow plum-like fruits, somewhat acid in taste and astringent in character. One of the most beautiful of all the fruiting herbaceous plants was a Solanum received from Vilmorin, Andrieux & Co., under the name of *S. ciliatum macrocarpum*. It had a spiny stem and leaves, and spreading branches borne down by the weight of the large, bright vermilion-red fruits; on comparing with herbarium specimens it appears to be identical with the Brazilian *S. aculeatissimum*.

A south African plant, a composite from the Karroo region, though not in flower at the time of our visit, is interesting on account of its having, more than any other at La Mortola, won the admiration of Queen Victoria when she visited Mr. Hanbury's garden in March, 1882. The plant in question, *Pteronia incana*, forms a dense, twiggy shrub, and has small, ashy gray leaves. The pretty yellow flower-heads so charmed the Queen that she took away with her a quantity of the flower-laden branches. Since then the species has been called in the neighborhood, "La pianta della reina"—the Queen's plant.

At Mentone, which is so near La Mortola that the climate of the two places must be almost alike, the mean temperature of November is fifty-four degrees Fahr., December forty degrees, February forty-nine degrees, and March fifty-three degrees. Nearly the whole of the annual rainfall takes place during the winter and spring months; during summer only an occasional thunder-storm comes to moisten the thirsty ground. The storing of water, therefore, for use during the hot, dry summer months is an absolute necessity, and entails much labor and expense.

George Nicholson.

Kew.

New or Little Known Plants.

Viburnum pauciflorum.

THIS pretty species, which attains a height of three or four feet only, might be described as a dwarf *V. Opulus*, with small cymes, terminating short, two-leaved, lateral branches, and without the showy neutral ray flowers of that species. It is a widely distributed northern plant, inhabiting cold, moist woods from Labrador to Alaska, extending south to the high mountains of northern New England, the Saskatchewan country, Washington, and to the Rocky Mountains of Colorado. *Viburnum pauciflorum* has recently been introduced into the Arnold Arboretum, where it has not, however, flowered. The small figure of a flowering branch from Alaska is Regel and Herder's "Plantæ Raddianæ" (iii. t. 1, p. 3), is the only one published previously to our illustration upon page 5, drawn by Mr. Faxon from specimens gathered among the White Mountains of New Hampshire.

C. S. S.

Foreign Correspondence.

London Letter.

THE year 1889 is practically over, so far as public horticulture is concerned. Exhibitions are at an end, the final periodical meeting has been held, and the only remaining attraction is a public dinner or so, at which hand-shaking and general back-patting will be in order. English horticulturists appear to be cultivating a love for public dinners in connection with their clubs, societies and shows; at any rate, they are much more frequent in recent years than they were formerly.

Next week I hope to be able to notice the principal additions that have been made this year to the list of good garden plants in England. Speaking from memory, I do not think there is anything remarkable to record in the way of new introductions. On the other hand, some very fine hybrids, crosses and varieties of garden origin have been added. Collectors confine their work chiefly to Orchids, so that comparatively little is to be expected from them. Hybridization is the great attraction of the time, and almost every man who has a garden tries his hand at crossing one plant with another, in the hope of getting something startling.

The last of this year's bi-monthly meetings of the Royal Horticultural Society was held on Tuesday, December 10th. Circumstances are totally against anything approaching a successful exhibition, or even a good muster of fellows in the middle of December. Despite this there were several exhibits

of more than average interest, and others which were worth going to see. Orchids were represented, first, by a basket of choice plants from Messrs. F. Sander & Co., amongst which were *Odontoglossum Wattianum*, the new species noted in my last letter: It is not bright in color, nor uncommon in form, and may be called a mixture of *O. luteopurpureum* and *O. Sanderianum*. Another plant shown as new, and named *Cattleya O'Brieniana*, is a variety of *C. Loddigesii* with the petals slightly broader and less curved. *Dendrobium Slatterianum* is a good variety of *D. bigibbum*, very dark in color,

spikes with 346 expanded flowers upon them. It would be difficult to surpass this *Masdevallia* as a free flowering, easily grown plant, but the specimen shown was a surprise even to those who know the good qualities of the species. Mr. Hodgson had grown this specimen from a tiny plant with two leaves, which he purchased for a guinea fifteen years ago.

Cælia bella is a Mexican Orchid which is not common in cultivation, but a plant of it shown by Mr. Malcolm Cook was ornamental enough to attract attention. It bore eight spikes of flowers, each spike with from four to six expanded



Fig. 1.—*Viburnum pauciflorum*.—See page 4.

the lower part of the lip being of a deep maroon; the middle lobe of this organ is also longer than in *D. bigibbum*. Some persons who saw it were inclined to call it a variety of *D. Phalenopsis*, and thought it might be a connecting link between that species and *D. bigibbum*. Whatever its affinity, *D. Slatterianum* is a pretty addition to the Australian *Dendrobiums*. *Aërides Savageanum* is a small flowered addition to the numerous, and, as a rule, handsome-flowered group of species represented by *A. odoratum*.

Masdevallia Tovarensis was exhibited in superb condition, the plant bearing 255 leaves, all perfectly healthy, and 162

blooms, which were two inches long, tubular, the segments spreading, recurved near the apex, and colored white with crimson lips; the lip is triangular and sulphur yellow in color. *Cælia* is a genus of some four or five species, three of which are in cultivation at Kew, but only *C. bella* is handsome enough to rank with garden Orchids. It has been in cultivation many years, and used to be known as *Bisfrenaria bella*. There is a figure of it in the *Botanical Magazine*, t. 6628.

Cypripedium Niobe, a hybrid whose parents are *C. Fairreanum* and *C. Spicerianum*, is one of the most charming of the

smaller hybrid kinds of *Cypripedium*, combining, as it does, the characters of two of the best species in the genus. The dorsal sepal is broad and recurved as in *C. Spicerianum*, but greener at the base and veined with purple. The petals are wavy, curved as in *C. Fairreanum*, deep green and bronze, the lip being small and greenish. Three plants of it in flower were shown by Messrs. Veitch, who raised it, and to whom a first-class certificate was awarded for it.

Other hybrids shown were *T. B. Haywood* (from *C. Druryi* and *C. superbiens*), *C. Galatea major* (from *C. Chantini* and *C. Harrisianum*), *C. Lceanum* and *C. Lathamianum*.

Cattleya Pallas, a hybrid raised from *C. Dowiana* and *Lalia crispa*, was also certificated, but its only good point was the color of the lip. In attractiveness the flowers were inferior to those of a good form of either parent. *C. Dowiana* has had little influence either on the color or form of the flowers. *Panda Amesiana*, with a strong spike of flowers, was shown by Lord Rothschild. Apparently there is some variety of color amongst the plants of this Orchid; some of them being inferior to others in the depth and clearness of the purple on the labellum.

Mr. Cannell showed a stand of cut flowers of *Zonale Pelargoniums*, for the cultivation of which he is famous. In England, and especially in the neighborhood of London, it requires considerable care and skill to bloom these plants well in December. When grown as Mr. Cannell grows them, with enormous trusses of flowers full of substance and clear in color, they are of the greatest value in winter. The best of those shown were the following: White flowered kinds, *Swanley White* and *Amy Ampheet*; pink, *Mrs. D. Saunders* and *Mr. Wildsmith*; pale blush, *Stella* and *Massey*; salmon, *Souvenir de Mirande*; scarlet, *Hyacinth* and *Brilliant*; purple or magenta, *Dr. Tucker* and *R. Dean*. I mention these because I do not think it possible to find better kinds amongst the many large-flowered *Pelargoniums* now grown. There are a few ardent admirers of these plants, conspicuous amongst them being Mr. Chamberlain, who devotes a large house to them in winter, and delights in their flowers as much as he does in Orchids. Mr. Cannell also showed flowers of *Chrysanthemum Mrs. E. W. Clark*, a child of America, I believe, and remarkable for its fragrance. It is a large flowered incurved Japanese kind, colored deep purplish magenta, and not very attractive. *Crimson and Gold* was another of Mr. Cannell's *Chrysanthemums*. It is one of the so-called single flowered section, and has a large, dark yellow disc with crimson ray florets flaked with yellow.

Some well flowered panfuls of the pretty, snow white *Narcissus monophyllus* came from Mr. Ware, of Tottenham. A few years ago this plant was extremely rare in cultivation, and was very difficult to manage. Now, however, it is easy to grow and flowers if only the bulbs are kept quite dry and baked in full sunshine all summer. It is a native of Algeria, where it occurs in abundance. Newly imported bulbs always flower with us in December, but after a year's cultivation in England they do not come into bloom before February. It may not be known to every one that *N. monophyllus*, sometimes called *Bulbocodium monophyllum*, has short, rush-like leaves, and pure white, hoop-petticoat-like flowers, in form like those of the well known *N. Bulbocodium*. The flowers remain fresh a month or more. One of the most striking of the exhibits was the *Carnation Winter Cheer*, the plants being less than two feet in height in perfect health, and covered with large full flowers, two and a half inches across, of the brightest crimson color. It would be difficult to find a better winter-flowering *Carnation* than this, and I am told it is one of the very easiest to grow.

The most attractive among the flowering plants in our stoves at the present time are *Ipomœa Horsfallii*, with its variety, *Briggsii*, and the closely allied species, *I. ternatea*. The first named extends over half the roof of the stove, its many shoots hanging down or festooned from pillar to pillar, and crowded with large clusters of rich, deep crimson, cup-like flowers. It has been beautiful for a month or more and will continue so at least as long again. The variety *Briggsii* has paler and slightly smaller foliage and rosy red flowers, whilst *I. ternatea* has flowers as large as those of the *Morning Glory* and as pure a white. We miss this year another beautiful flowered species of *Ipomœa*, that is, *I. rubro-cœrulea*, a stove annual, which may be grown so as to bloom in midwinter. Treated liberally, it covers a large space in a short time, and in winter its shoots are wreathed in large, flat-limbed flowers of the purest china blue, fading to mauve. That remarkable species, the *Moon Flower* of the tropics (*I. Bona-nox*), whose great white flowers expand only at dusk and close at sunrise, has also been flowering here for some time. I measured a flower lately, and it was exactly six inches across.

Kalanchoe carnea.—I am afraid that this new introduction has been somewhat overrated; at all events, none of the examples I have seen this year are sufficiently attractive to rank among good conservatory winter flowering plants. The habit is erect, branching, about two feet high, the leaves coarse and soft, and the terminal heads of flower, whilst large and full enough, are too undecided in color, being neither white nor rosy, but a dull milky color. With good cultivation and selection there may be something of value got out of this plant, but the type does not please. It was introduced last year from south Africa, and received a first-class certificate from the Royal Horticultural Society. *Begonia geranioides* is one of the most charming of late or winter flowering species. It is deciduous, about a foot high, and produces numerous erect peduncles of elegant pure white flowers. A group composed of three dozen or so plants of this species, *B. Socotrana* and the variety *John Heal*, mixed together, is one of the most charming pictures one could desire to see in November or December. *B. geranioides* is a native of the Cape.

London.

W. Watson.

Cultural Department.

Sowing Seed.

THERE are few good sowers of seeds. To buy seeds and to cover them with earth comprise the sum of practice with many people, and failure to get the most from seeds means more than the loss of the seeds themselves, for it is indication of general incompetence or shiftlessness. To sow well is the first operation to acquire in gardening; propagation by cuttings is the second.

Two or three general rules are fully as important as many of the explicit instructions: 1. Do not be in a hurry. In all my teaching how to sow it is necessary to make this the important point. It means taking an abundance of time to prepare soil and to provide proper conditions. Ten seeds well sown are more valuable than fifty half sown, and, as a rule, the more valuable the plants to be grown the more imperative is this rule. 2. Avoid short-cuts which are wholly artificial. In all the long catalogue of compounds devised to hasten germination, I do not know one which is worth its cost or trouble. It is always legitimate to hasten germination, but it must be done by perfecting natural or normal conditions. 3. In cases of doubt as to the proper method of handling rare or choice seeds, sow in installments, at intervals. This means experiment. With practice comes an almost intuitive faculty to determine at once what are the proper methods of dealing with seeds with which we have never had experience. But until this faculty comes, safety demands caution. And some people never acquire the faculty. The gardeners of my acquaintance are comparatively few to whom I would entrust an entire sample of strange seeds from another region; not because I could do better with them, but I can learn from a few how to handle many. I once failed completely in an attempt to grow weak seeds of a couple of species, although the year after, profiting by failure, I secured an abundance of fine plants from the same samples.

Seed-sowing comprises three distinct subjects: 1. Selection of the seed. 2. Treatment of the seed preparatory to sowing. 3. The sowing itself. In the first division are to be considered all those questions concerning the age of the seed, the condition of the parent plant, weight, color, and so on. These matters are too extensive for discussion here. The remaining points may be considered.

TREATMENT PREPARATORY TO SOWING.—There are many kinds of seeds which demand some particular treatment before sowing. These are seeds of most fruit plants, nuts and bony seeds, and various sorts of pulpy fruits. The pulp of fleshy seeds and fruits should be removed before seeds are sown. The pulp is usually removed by maceration. The berries of Red Cedar, Raspberries, Cranberries and the like are mashed or bruised and placed in water until the coverings become soft. This occurs in a few days in such soft fruits as Raspberries and Blackberries. The pulp rises and the seeds settle, and it often becomes an easy matter to separate them; or, if the pulp still adheres to the seeds after a short period of maceration, it may be cut by the addition of a half stick of caustic potash to a pail of water. The seeds are allowed to remain in the potash water but a few hours at most, when they are strained out and rinsed in fresh water. They are then spread upon tables to dry. Sometimes I remove the pulp by rubbing the seeds in sharp sand. The fruits are buried in clean, sharp sand until the fleshy portions become nearly dry, when the whole mass is rubbed through the hands until the

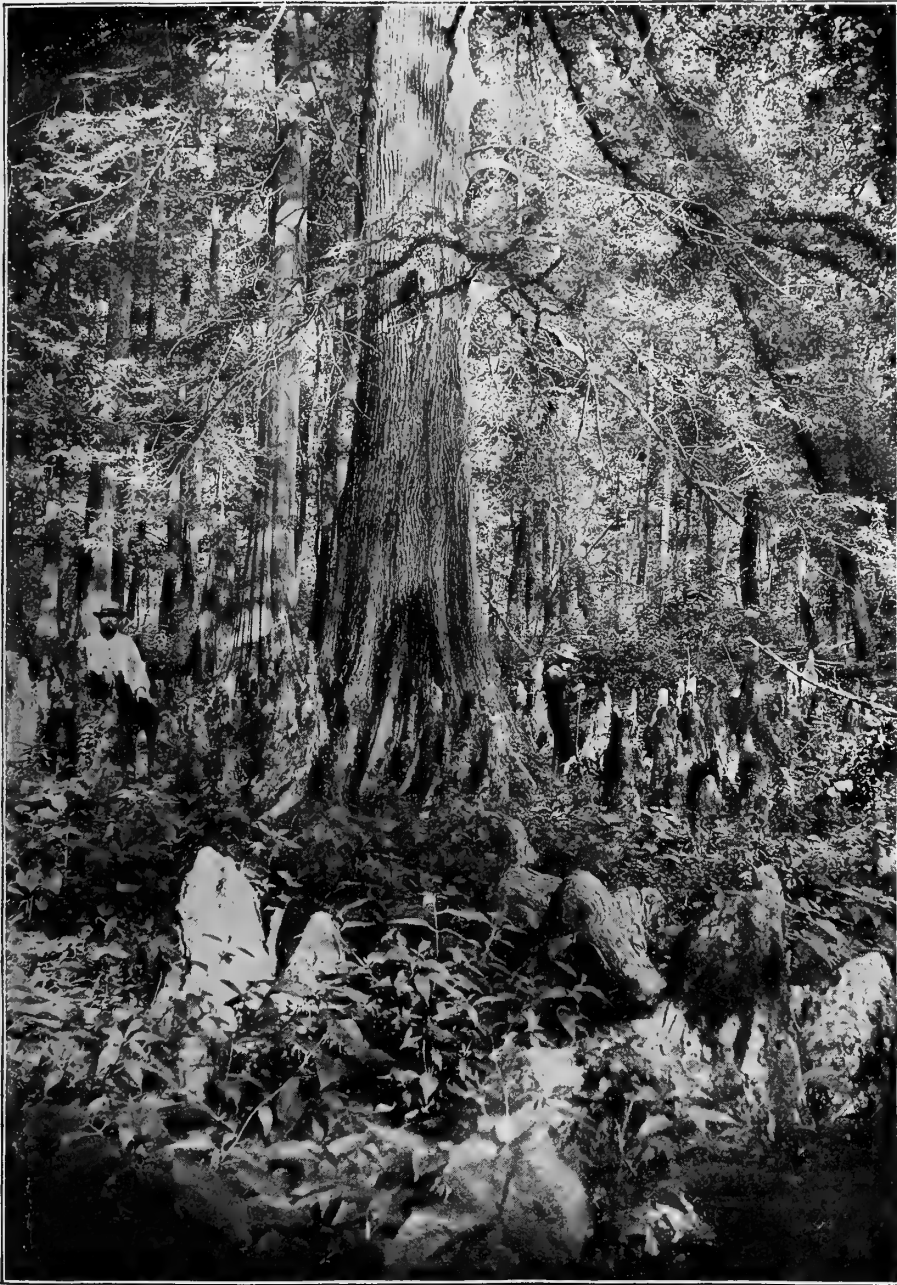


Fig. 2.—A Cypress Swamp in Southern Indiana.—See page 2.

seeds are liberated. It is often impossible to separate the seeds from the fragments of pulp and the particles of sand, nor is it necessary to do so. I sow sand, pulp, seeds and all, in many cases. In the case of rare seeds, however, I manage, by sifting the sand before it is used, to sift out the seeds with tolerable accuracy. In all cases in which the seeds are few and valuable, I should prefer to rub them out rather than to macerate them. There are some seeds which are injured by maceration, unless the operation is expeditious.

All seeds with bony coverings, such as nuts, pits and the like, should be procured as soon after maturity as possible, and put in stratification during the winter. This operation consists in burying seeds in layers of clear sand and exposing them to the weather of winter. A layer of sand an inch or two deep is placed in the bottom of a pot or box, and alternate layers of seeds and sand are added until the pot is full. The pot is now buried a foot or so below the surface in a sandy and well drained soil, or it is placed in a partially protected pit. This prevents the seeds from becoming hard and dry, and the freezing and thawing, with a little variation in moisture, soften or rupture the integuments. It is a popular notion that freezing is necessary to the germination of Peach-pits and similar seeds, but this is an error. Freezing hastens germination by hastening the rupture of integuments, but artificial

cracking is as good. It usually happens, however, that buried pits, even though not split by frost, germinate better than those stored in a building and cracked by hand, but this is due to the fact that the buried seeds have not been allowed to become dry and hard. There are certain seeds and fruits which demand particular methods of handling for purposes of convenience. I stratify walnuts and butternuts by heaping them into a pile out-of-doors, mixing in sand and leaves. Acorns are simply kept in boxes of moist leaves. If the seeds are small and few, I place them between layers of thin muslin before stratifying them. They are then easily separated from the sand.

Stratification and sowing may sometimes be combined. If the ground is well drained and well prepared, seeds of Apples, Pears and berries may be sown in the fall, where they are to grow, with good success. I rarely have good success with Apple and similar seeds purchased of seedsmen. The seeds have been so thoroughly dried that they are often past recovery. The best practice in such cases, probably, is to soak the seeds a few days, exposing them to a few sharp frosts. If fruit seeds are to be transported they should be packed in some material which will preserve tolerable uniformity of moisture. Pear-seeds which I have imported from France, packed in powdered charcoal, have germinated speedily.

Many hard seeds do not germinate the first year, even with the best treatment. The seeds of Thorns and other wild fruits belong to this category, and even the seeds of many herbaceous plants behave similarly. Sedges often require two years in which to germinate, and it is unusual for seeds of the wild perennials to germinate until the following spring, even if they are sown as soon as they are ripe. All that can be done with such seeds is to sow them in permanent beds and keep the land clean until the plants appear. I prefer to sow rare seeds in pots. The pots are then plunged in earth in a cold frame, which is placed on the north side of a building or in such a position as to be partially screened from the sun. The frame is then covered with a sash, or, better, with plant-bed cloth. About 100 pots of seeds of Sedges and other wild herbs were sown here last spring, and at the present time less than one-fourth of the kinds have germinated. The pots in which plants have appeared will be plunged in a pit in order that the roots

may not freeze dry, and the remainder will remain for a year or two until germination takes place.

MANNER OF SOWING.—Only general hints can be given as to the manner of sowing. Explicit instructions must come with instruction for the cultivation of the particular species. Much has been said concerning the depth of sowing, and rules drawn from the size of the seed have been made; but arbitrary instruction cannot be given. In houses where uniformity of moisture can be maintained, people sow too deep oftener than too shallow. Simply covering the seeds with soil enough to hold moisture is sufficient in most cases, and seeds thus planted are not liable to rot or to be delayed by too much water. The condition of the soil as concerns moisture must always determine the depth of planting in the field also. Plant deep in dry soils and shallow in moist soils. In other words, plant just deep enough to ensure uniformity of moisture.

In fact, the commonest cause of failure in seed-sowing is too much moisture. This is particularly true in the case of old and weak seeds, which are quickly killed by much wetting. Seeds from remote parts of the world, or which, I have reason to suppose, possess low vitality, are never watered directly. They are sown in a pot, and this pot is set inside a larger one, and the intermediate space is filled with sphagnum or packing moss. The water is applied to the moss, and it passes through

the inner pot and into the soil. The seeds of two species of *Capsicum*, injured by too great heat in drying, failed completely in 1888 when sown in pots and watered in the ordinary manner; but this year seeds from the same saving were sown in the way described, and all, or nearly all, sprouted quickly. Thomas Andrew Knight used to sow rare seeds by simply placing them between dry sods from an old pasture. But any method which ensures uniformity of moisture, and a small amount of it, will give success. Recent tests conducted in our houses show conclusively that seeds usually receive too much water.* There is even danger, as we have sometimes found, of keeping the soil too wet through the use of the sphagnum process outlined above.

So I repeat that the most important point in sowing is the relation of the seed to moisture. I prefer to sow shallow, and then to pack the earth to retain moisture, or if the earth is liable to bake, I cover it lightly with leaves or fine litter, or with boards. Very small seeds I sow upon the surface of well prepared soil, and then sprinkle a very little fine soil over and among them; then I cover with paper, or with a board or something to prevent excessive evaporation. I rarely expose the pots or boxes of such seeds to the light, for the heat of the sunlight accelerates evaporation. It is largely the uniformity in moisture which causes the results of seed tests to read higher than the results of actual sowings in the field. Eight experiments to determine the percentage of variation between tests made in the house and sowings made in the field, with seeds from the same packets, gave the following differences: Pea, 1.1 per cent.; Endive, 17.5; Tomato, 25.5; Celery, 30; Onion, 32; Carrots, 42.5 and 50.5; Turnip, 57.5. These remarkable variations were almost wholly due probably to variations in moisture in the field sowings, and yet the soil in which the sowings were made happened to be unusually and uniformly moist for a light soil.

Cornell University.

L. H. Bailey.

Stove Plants in Flower.

AMOMUM MAGNIFICUM.—*Amomum* is a large genus of tropical Gingerworts, and is related to *Hedychium*, *Curcuma*, etc. Of the fifty species described, that under notice is by far the handsomest; indeed it is the only one which can be considered of any horticultural merit. Although introduced into England in 1832 by Lord Milton and flowered in his garden at Wentworth, it does not appear to have kept a place among garden plants. The picture in the *Botanical Magazine*, t. 3192, gives a good idea of the remarkable character and beauty of this species, and I believe it was on seeing this picture that Sir George Macleay, of Pendell Court, one of our most enthusiastic amateur gardeners, procured plants of it from Mauritius, where it has become naturalized, having been introduced from Madagascar, its home. The plant at Pendell Court has just flowered, and the inflorescence has been forwarded to Kew. In habit and general appearance *A. magnificum* is similar to *Alpinia nutans*, but the stems attain a length of twelve feet, whilst the lanceolate leaves are two feet long, or even more. In *Alpinia* the flowers are in terminal heads on the leafy stems, but in *Amomum* they are borne on a separate stem or scape, which is leafless and about four feet high. The flowers are arranged in a dense conical head, which is surrounded by eight or ten large bracts, four inches long by two inches wide, rather fleshy, recurved and colored rich cardinal, the margins being white; in addition to these large bracts, each of the hundred or so flowers is overtopped by a smaller spatulate, curled bract, similar in color to the large ones. The effect of this head is really fine. The plant grows in wet places, that at Pendell Court being in the corner of a tropical tank on a large mound of mud-like soil. It is similarly treated at Kew. For cultivation in large tropical stoves, and especially for aquaria, this plant may be specially recommended. It has been called *Alpinia magnifica* and *Nicolaia imperialis*.

RHIPHALIS HOULLETTII.—Several good specimens of this ornamental plant are now flowering freely at Kew. The genus *Rhipsalis* is scarcely known in gardens, owing to the smallness and lack of ornament in their flowers generally. Botanically, however, it is one of the most interesting of the genera included in *Cactaceæ*, the great variety in the form and habit of the stems of the thirty or so species known being quite exceptional. Some resemble Mistletoe, others Marsh Samphire, others *Mesembryanthemum*, others *Epiphyllum* and so on. A collection representative of the most marked species is grown at Kew, and it always attracts attention. The genus is also interesting from the fact of its being the only one among the *Cactaceæ* found wild in Africa, Mauritius, Madagascar and Cey-

lon, as well as in America. *R. Houlettii* has long, graceful branches, partly round and twig-like, partly flattened, as in *Phyllocactus*. It branches freely, and when well treated it forms a well furnished, elegant pot-plant. The flowers are borne singly in the numerous notches of the flattened portions of the branches. They are nearly an inch across, not unlike those of a *Mamillaria* in form, and colored pale creamy yellow, with a crimson eye-like spot in the throat. They are also fragrant. Under cultivation the plants are about three feet high, but in its native haunts it hangs from the trunks of trees to a length of many feet. All the *Rhipsalis* are epiphytic in a state of nature, but they thrive when cultivated in pots or baskets in a light stove. Flowering in November and December, *R. Houlettii* is worth growing in every collection of stove plants. It is native of Brazil.

Kew.

W.

Orchid Notes.

***Dendrobium formosum*.**—This is without doubt the finest white-flowered *Dendrobium* yet known, its blooms far surpassing those of its allies, *D. Draconis* (perhaps better known in gardens as *D. eburneum*), *D. infundibulum* and *D. Jamesianum*. It has a wide geographical distribution, being found in north-eastern India, Burmah, extending to Moulmein, and it grows also along the coasts of the Andaman Islands, and is consequently subject to variable climatic conditions. It has been over half a century in cultivation, the first plants of it having been sent to Chatsworth in 1837 by Gibson, who found them on the Khasia Hills. Its first discoverer, however, was Roxburgh, who detected it growing in Sylhet five or six years earlier. The characteristics of *D. formosum* are its stoutish terete stems, which when young are covered with short blackish hairs and furnished with ovate-oblong, deep shining green leaves, four or five inches long, and obliquely emarginate at the apex. The old stems are deeply furrowed, leafless, and often clothed with dull silvery sheaths. From September to Christmas fascicles (or clusters) of from three to five large flowers are produced at the top of the young stems before these latter have finished their growth; but it is not unusual, however, to see the old stems also bearing flowers. The sepals and petals are pure white, the former being oblong-elliptic and keeled behind, the two lower ones connate at the base and produced into a spur. The latter are much broader and obovate, while the white lip, which, when spread out, is rhomboidal retuse, but more or less funnel-shaped in its natural position, has a stain of bright orange-yellow on the disc, the latter being traversed by five slightly raised and asperated keels.

The variety known in gardens as *D. giganteum* is remarkable for the extraordinary size of the flowers, which are half as large again as those of the ordinary type, often measuring from four to five inches across.

Plants of this species may be grown either in pots or baskets, but the latter are preferable, as, when wires are attached, the plants can be hung nearer the glass, and thus obtain a clearer light. Plenty of heat and moisture are essential to them during the season of growth, and they may be freely watered and syringed. The flowers appear on the growing stems, and when they have disappeared it is generally a sign that growth has almost ceased, and the plants should then be placed in a slightly cooler house to rest for two or three months, only receiving water at intervals in order to keep the growths from shriveling. A compost of rough fibrous peat, with a little sphagnum, is very suitable for them.

St. Albans, England.

John Weathers.

***Lælia Crawshayana*.**—This very rare and interesting Orchid is now in flower with us. It is presumed to be a natural hybrid between *L. anceps* and *L. albida*.

The inflorescence strongly resembles the former, while the vegetative organs are almost identical with those of *L. albida*. It certainly is a great improvement on the latter, while retaining all its pleasing Primrose-like fragrance. As is the case with most hybrid Orchids, this is a robust grower. The clustered bulbs are compressed, pyriform and slightly furrowed, bearing one or two lanceolate acute, leathery, deep green leaves. The scape proceeding from the top of the bulbs is about eighteen inches long, jointed, with sheathing keeled bracts, terminating in a cluster of three to four flowers. These are about three inches across, with narrow sepals and broader petals of dark rose. The narrow three-lobed lip is white, with the side lobes tipped with rose, and the anterior one rosy purple. Lines of yellow run down the middle of the lip, and the throat is streaked with maroon. *L. Crawshayana* was introduced six years ago, and but very few plants are yet in cultivation.

* Bulletin ix., Cornell Experiment Station.

Lælia Gouldiana, like the preceding, is a natural hybrid, having for parents *L. anceps* and *L. autumnalis*, but it does not betray its origin in so marked a degree. Its vegetative organs vary very little from those of *L. autumnalis*, except that the bulbs are more slender and furrowed. The leaves are long and narrow—either one or two on a bulb. The flowers partake of the characters of both parents, but the petals are broader than those of either, more resembling Dawson's variety of *L. anceps*. The lip is shaped like that of *L. anceps*, with the lobes purple-crimson and a bright yellow crest. The sepals and petals are of a very dark rose, intensified at the tips. The scape is about eighteen inches long and bears four to six flowers. It is a very handsome Orchid, but, unfortunately, it has inherited the repugnant odor of *L. autumnalis*. *L. Gouldiana* is an American introduction, having been found among a batch of Mexican Orchids imported by Messrs. Siebrecht & Wadley three years ago. It is now fairly plentiful. Another species of this series has recently flowered in a New York collection, and it is evidently a hybrid between *L. autumnalis* and *L. albida*. I am told the growth is very like the former, but I have only seen one flower, which I thought very pretty, and which seemed intermediate between its supposed parents. This plant is not as yet named.

Miltonia (Odontoglossum) Razlii is nearly always in flower with us, and we find it very useful for cutting, as it lasts quite a long time in water. We always found it difficult to grow so long as we treated it as a cool Orchid. It would gradually dwindle away and be eaten up with thrips, and we seldom saw a flower. We now grow it in the hottest corner of the Phalænopsis house, with the glass extra shaded even in winter. We keep the plants very wet and syringe them two or three times a day. Under this treatment they grow like weeds, making leaves sixteen inches long by one inch broad, and fine, stout bulbs, which improve every year, and produce two or three racemes apiece. Thrips are never seen now. The soil we use consists of equal parts of sandy peat and moss, using small well drained pots. *Miltonia Razlii* was discovered in the warmer regions of Columbia in 1873. The bulbs are somewhat compressed, ovate-lanceolate, two or three inches long, surmounted by one or two linear-lanceolate leaves, and from the base of the bulb spring pairs of long leaf-like bracts which enclose the three to four flowered racemes. The whole plant is of a uniform pale green color. The flowers are large, and pure white, excepting a blotch of rich crimson-purple at base of the petals. The lip is large and flat, comprising two-thirds of the flower, pure white, stained with yellow at the base, from which radiate narrow lines of brown. The variety Alba is inferior to the type, from which it differs in having no blotch at the base of the petals. The value of the flowers is enhanced by a very pleasing fragrance.

F. Goldring.

Kenwood, N. Y.

Christmas Roses.—It is to be hoped that the two interesting articles on Hellebores, in GARDEN AND FOREST of December 18th, will lead to discussion and additional notes from cultivators. The best varieties of Christmas Roses are perhaps the largest and most attractive flowers which bloom at so low a temperature, and they are very desirable in gardens if established in suitable locations. They are Alpine plants, and naturally bloom as soon as melting snow exposes their buds to the sun's influence. Planted on a rockery with a northern exposure no doubt they would follow out their natural course; but we wish them to bloom during the winter with as little protection as possible, for they need protection in an ordinary season in this latitude. Mr. Orpet's record of successful bloom in the open ground probably could not be often repeated; this season having been remarkable for its freedom from binding frosts, by which these plants are promptly made dormant. Hellebores have excited much interest in recent years, and rather divergent cultural directions have been given, as in the notes spoken of one advises light soil, the other retentive. Both recommend shade, while Mr. H. Correven ("Les Plantes des Alpes") says they require a deep, heavy soil and exposure to the sun. As usual, when such varying directions are given, it will be found that plants will grow any way if given a fair chance. Hellebores appear less amenable to good treatment than any plants which have come under my observation, and pursue the cycle of their growth with little deviation, so far as I can see, from any extra care. As to division, my best flowers this season were from plants divided in June. The problem is not so much how to grow them, but how to bloom them as is done in England and Ireland during the winter, so that one can enjoy them. The climate in my locality will not usually admit of their open-air culture after December 1st, and I keep them in a warm cold frame; but my floral enthusiasm does not go so far as to

enjoy flowers blooming in a frame. A cold house from which frost is excluded would probably meet their requirements exactly. This year noticing that some bits of Madame Fourcade, which happened to be in the greenhouse, grew away vigorously when heat was started, I have tried the experiment of blooming a few plants there in the coolest part. *H. abchasicus albus* and *H. purpurascens* (which are usually known as Lenten Roses) bloomed very well. *H. Caucasicus* gave me beautiful flowers, while the buds of *H. ruber* and *H. angustifolius* are still unmoved. New leaves are starting, and I am interested in the result of the experiment next season. One authority says I shall lose my plants, another that I shall lose my flowers. As plants growing vigorously do not seem in great danger of death, perhaps the next blooms may appear when due. A number of consignments of Hellebores are received and sold in New York annually. They are usually Lenten Roses, often Dutch Hybrids. The major part probably perish promptly from wet and rot when planted out, victims of the tradition that Hellebores bloom in the snow at Christmas.

Elizabeth, N. J.

J. N. Gerard.

The Forest.

Forests and Floods.

IN connection with the propositions of the Forestry Congress at Philadelphia and the American Association for the Advancement of Science in Toronto recommending the establishment of a Commission to inquire into the relation of the forest areas on our western mountains to the water supply of those regions, it will be of interest to note two publications just issued from official sources in Europe. The one is the draft of a bill for a new forestry law in Austria, accompanied by a detailed report setting forth the reasons for the provisions of the law; the other is the report of a royal commission of Baden, appointed to investigate the connection of the forest conditions of a section in the Black Forest with the disastrous floods of the Rhine in the winter of 1882.

The first report, from the able pen of the Imperial Privy Councilor and well known meteorologist, Dr. Lorenz von Liburnau, discusses briefly and in general our present knowledge in regard to forest influences on climate and water flow, reaching the conclusion that, while many of the popular ideas on these subjects are derived from imperfect observation and are, therefore, without foundation, or, at least, unproved, nevertheless the evidences from scientific investigation that these influences do exist are sufficient to warrant a conservative forest policy on the part of the government.

The report of the Royal Commission of Baden concerns itself with a special case and is of unusual interest, as it presents for the first time a thorough, though only partial, investigation into the relation of forests and floods. That the verdict in this case is negative does not detract from the value of the report, as showing the method by which this question must be treated; nor does it follow—and the commission takes pains to make this statement—that a generalization or final settlement of the question has been reached by this investigation.

This commission was composed of an officer of the Central Bureau for Meteorology and Hydrography, an officer of the Engineer Department, and an officer of the Forestry Department. The work of this commission was called forth by the disastrous floods of the Rhine and its affluents in 1882-3. These led, also, to the appointment by Prince Bismarck, as Chancellor of the Empire, of a commission for the purpose of studying the Rhine, to determine whether there had been such a deterioration in its water conditions as might justify reforestation and the construction of reservoirs, or the adoption of some other plan than correcting the river-bed in the upper portions of the affluents. The Baden Commission made a very careful survey in that part of the Black Forest which forms the watershed of the Alb River, one of the smaller affluents of the Rhine.

Such a survey comprises not only the geographical, climatic and geognostic conditions of the water-shed, but more specially gives detailed descriptions of the various kinds and uses of the soil, whether under tillage or in pasture, meadow or forest, swamp land or moor land. It explains the systems of water-courses, the utilization of the waters by mills, etc., and the damage done by floods and other unfavorable conditions of waterflow. A few of the data, which together give a comprehensive view of the region, may be of interest for the understanding of the conclusions reached. The watershed discussed comprises 93.5 square miles, the larger part (fifty per cent.) with slopes varying from ten to thirty degrees. The

precipitation at two stations situated at altitudes of 3,310 feet and 1,250 feet had been in an average of fourteen years sixty-five and fifty-eight inches respectively, while during the year 1882 it reached eighty-nine and eighty-one inches, or about thirty-eight per cent. more than usual.

Of the soil, which, for the most part, is derived from granites, gneisses, sandstones and clay-slates, eighty-six per cent. were found impermeable. Forest occupies fifty-one per cent. of the whole area, very unevenly distributed, showing, in the various localities, a range of from twenty-two to ninety-one per cent. Of this, sixty-three per cent. is composed of Spruce, the balance of Beech. The forest, to the amount of sixty-one per cent., was owned by private individuals, in small parcels; and this part was found more or less in poor condition, owing to mismanagement, with openings or thinly stocked places, especially along steep slopes, with poor roads and suffering from destructive pasturage. The forty-nine per cent. of government and communal forest was in good condition.

Some of the conclusions and observations, in which the report abounds, are as follows: First. The observations at the two stations mentioned before "justify the conclusion that the large percentage of forest (fifty-one per cent.) has caused a considerable increase of rainfall." For, while the average amounts of precipitation for Germany at the same, or nearly the same altitudes, are twenty-seven and a half and thirty-eight inches respectively, the values at these stations, as stated above, are thirty-four per cent. and fifty-seven per cent. higher.

Second. The retention and retardation of waters, and especially the slower melting of the snow under the forest cover, is acknowledged. In exceptional cases, however, this influence of the forest, it is stated, may become ineffectual, namely, during an unfavorable sequence of periods of heavy precipitations, as was the case in the catastrophes of 1882.

Third. "Entirely beyond dispute, and, hydrologically, of the greatest importance, is the binding of the soil effected by a forest cover, and, in this respect, the forest of the Alb watershed fulfills its function as a protective cover fully. The satisfactory condition of the water-courses and valley-bottoms and the moderate extent of the damage experienced from the floods in this watershed are due to the small amount of detritus. The soil conditions being extremely favorable to the formation of detritus and rock chutes, their absence can only be due to the forest cover on the declivities." Where such masses of detritus and waste rock and landslide material are found (on about sixty acres) they can be traced to improper deforestation and pasturage.

Fourth. An influence of the forest on the flow of springs could not be stated in the region, although it cannot be generally denied.

Fifth. The employment of flood-reservoirs is discounted, as disproportionately expensive.

Sixth. The influence of the Alb forests on the waterflow is stated in summary to the effect that, while the forest could not have prevented such an extreme flood as that of 1882, yet, on the other hand, to the forest is due that the Alb watershed experiences such disasters "only very rarely," and more rarely than adjoining valleys with a smaller proportion of forest area.

This report, treating the question of forests and floods without any preconceived theory to prove, will impress the reader with the fact, which cannot be too strongly insisted upon, that only a careful survey of local conditions can enable us to determine how far in any given case a forest cover acts upon hydrologic conditions.

Not only do rainfall conditions, and the conditions of the forest itself, determine the office of the latter in water distribution, but the geological and physical conditions of the soil and its topography, the conditions and comparative length of the water-courses, are also prominent factors of influence. These are elements which enter into the discussion of the character of the "run-off" only; when the broader question of available water supplies is considered many new elements enter, such as the interception of rainfall by the foliage, the dissipation of water by evaporation, by transpiration, by seepage, and in other ways.

Department of Agriculture, Washington, D. C.

B. E. Fernow.

Correspondence.

The India Rubber-Tree.

To the Editor of GARDEN AND FOREST:

Sir.—Referring to the article upon the India Rubber-tree published in your issue of November 13th, it is, perhaps, worth while to call attention to the ease with which that beauti-

ful tree can be propagated for cuttings. As is well known, it is only necessary to take a piece of a branch and insert it into moist sand and to protect the cutting with a bell-glass to secure a rooted plant; but it is less well known, perhaps, that the last articulation of the branch is capable of making roots much more quickly and readily than those lower down. Mr. Gamble, inspector of the forests of Madras, in south India, tells me that when they desire, in his district, to make plantations of this valuable tree, workmen always take the end of a branch with a single leaf for the cutting, as experience has shown that this is the way to obtain plants quickly and surely, and I believe that horticulturists would do well to follow this plan always in propagating *Ficus elastica*.

This tree, by the way, does not demand a real tropical climate. On the contrary, it flourishes outside the tropics in regions where snow falls sometimes and which experience several degrees of frost. I have seen in the beautiful garden of Hamah, near Algiers, specimens of *Ficus elastica*, and of its relative, *F. Roxburghii*, as large as our large forest-trees, casting a shade blacker and thicker than I have ever seen before. Generally, the genus *Ficus* is hardy and easy to acclimatize.

Ficus australis succeeds admirably in Algiers, and *F. Ben-jamina* is used in the same city as a shade tree in the suburb of Mustapha. There is a large specimen of *Ficus australis*, already old, on the Italian Riviera at Mentone, which, protected on the north by a house, forms a superb mass of dark green foliage; and at Cadiz there is a handsome avenue of large Fig-trees, with small leaves, not far from the Botanic Garden. These are trees two feet or more in diameter of trunk, with thick spreading heads. There are often severe frosts, however, in all these regions.

With regard to the fruit of *Ficus elastica*, I have once seen it on a small plant cultivated in a pot at Bâle, so that it appears that this species bears fruit sometimes in a comparatively young state.

H. Crist.

Bâle, Switzerland.

Winter Protection of Plants in Germany.

To the Editor of GARDEN AND FOREST:

Sir.—An American is surprised to find so many trees, which are quite tender around Boston, hardy in the latitude of Berlin, although the latter city is so many hundred miles further north. Lawson's Cypress and its varieties, Oriental Arbor Vitæ and the various forms of *Retinospora*, for example, seem to be in good condition here, without any protection whatever. So also are the fine specimens of Tree-Box, the foliage of which so often suffers in Massachusetts. The varieties of Ivy show also a marked difference in vigor and hardiness, and are much used as an edging of beds and for low hedging. Probably this difference is caused by the steadiness of the cold here. The sun is so low during the winter months that it has little power, even in the clearest of the short days. As an illustration, a sharp hoar frost on the 10th of November was followed by a beautiful clear day, during which the frost remained all day on the northern slopes of the roofs. The moisture of the air is also a noticeable peculiarity. After several days of steady frost, which permitted skating at Berlin and Dresden on the 17th of November, the moisture had so congealed upon the forests that they appeared to have been visited by a considerable fall of snow.

Undoubtedly the evergreen trees of America suffer from exhaustion caused by the cold, dry winds which sweep through them when the sun runs high, in March. But on the other hand there are many kinds of plants which will not endure this prolonged dampness and freezing of the German climate. Special care is taken for the protection of all such plants. In the gardens of the cities and suburbs, and indeed in the grounds of the nurserymen, the principal material for covering is the boughs of the Norway Spruce. This is regarded as much better than leaves, or anything else that is available. It lies so lightly and is so free from dampness, as compared with leaves, that it is much preferred. And it is laid on with so much neatness and taste as to give the beds the appearance of a plot of living green. The sides of houses, where the *Bignonia* and other vines are trained, are laced up with these boughs so neatly that they seem, at a little distance, covered with Evergreen Ivy.

Our hardy perpetual Roses suffer severely in this climate unless protected, and the boughs prove to be best for this purpose. The bushes are bent and pegged down close to the ground, and are then completely covered with the small branches, usually about two to three feet in length. The systematic trimmings from the forests will, of course, give an unlimited supply of this material, provided the distance of transportation is not too great.

Berlin.

W. C. Strong.

The Cultivation of Chrysanthemums.

To the Editor of GARDEN AND FOREST:

Sir.—Do the best growers of Chrysanthemums agree as to whether it is better to set out the plants in the spring and pot again in September, or to continue the plants right on through the summer in pots?

Why do Chrysanthemums in my greenhouse have a much lighter shade than the same varieties out-of-doors or in some one else's greenhouse? I notice that the Shakespeare, which has considerable pink in its color out-of-doors, is a pure white in the greenhouse with me.

Plainfield, N. J.

C. D. W.

[The practice of the best cultivators is not uniform and fine flowers can be had in either way. The essential point is constant care, so that the plants never suffer from too much water, and on the other hand are never allowed to become dry, nor starved, nor to receive a check in any way. During summer growth the plants may require closer attention if they are in pots; but after all the danger of a check from transplanting is more serious, and most amateurs find it almost impossible to have first-rate, solid flowers by planting in the open ground and lifting in the fall. Plants in the open ground should be potted at the end of August, and a week before they are lifted the roots which extend beyond the dimensions of the pot should be cut off.

Inferior or lighter colors in the flowers may come from starvation, from too much heat, from allowing too many flowers to remain on a plant, or more generally from insufficient light. In any greenhouse, flowers of a pink or lilac shade will be lighter than they are in the open air.—ED.]

A Mild December.

To the Editor of GARDEN AND FOREST:

Sir.—Flowers are opening on *Spiraea Thunbergii* and *Erica carnea*, and buds are ready to burst on *Lonicera fragrantissima*, *L. Standishii* and many other shrubs. On Christmas the thermometer stood at sixty-six degrees in the shade, and a few more days of this weather would force most of our early flowering shrubs into bloom. I hardly dare think of the danger which a sudden change to a zero temperature might cause in the case of many plants, and yet just such a change is likely to happen any day.

Arnold Arboretum.

Jackson Dawson.

To the Editor of GARDEN AND FOREST:

Sir.—Since the 1st of December we have had an unbroken succession of sunny days and frostless nights. The frost in the last days of November nipped the tops of the Scarlet Geraniums, but they have made new shoots several inches long. The Verbenas are still in full beauty; Violets are perfuming the air in all the city yards; Roman Hyacinths have been in bloom outside for over a week; *Lonicera fragrantissima*, which usually blooms on the naked wood in spring, has not yet lost its green summer foliage, but is full of flowers; *Jasminum nudiflorum* is covered with bloom; *Spiraea prunifolia* is in full bloom; *Vinca minor* is covered with blue flowers, and *Solanum Capsicastrum* carries its load of scarlet fruits with no sign of injury.

Raleigh, N. C., December 25th.

W. F. Massey.

To the Editor of GARDEN AND FOREST:

Sir.—Yesterday while passing through the fields I noticed the following plants in flower: *Taraxacum Dens-leonis*, *Maruta Cotula*, *Capsella Bursa-pastoris*, *Polygonum aviculare*, var. *erectum*, *Stellaria media*, *Cerastium vulgatum*, *Poa annua*.

Excepting the first, these all grow on low moist ground, and within a few feet of each other. Besides these, I found *Malva Rotundifolia* well budded, and the trailing *Arbutus* and *Hepatica triloba* with buds almost ready to open.

Youngstown, O., December 19th.

R. H. Ingraham.

Periodical Literature.

Mr. Edward L. Greene prints in his *Pittonia*, under date of December 10th, of which advance sheets have reached us, an interesting paper on the North American *Neillia*, which he retains in *Neillia*, published by Don in 1825, discarding the later *Physocarpa* of Rafinesque, adopted by Maximowicz, the last author to study critically the *Spirææ*. Mr. Greene points out that the leaves upon vigorous shoots are rarely found in her-

bariums, although they often afford valuable characters, being really the normal or typical leaves, while the flowering and fruiting branches usually collected are in reality nothing more than leafy peduncles, on which the leaves are greatly reduced generally in size and often altered in shape, a fact which is equally applicable to the true *Spirææ*s. Mr. Greene increases the number of American species of *Neillia* from two to four. The Pacific Coast plant, first described by Pursh as *Spiræa capitata*, which has been included by most botanists with the eastern *N. opulifolia*, is now considered a species under the name of *N. capitata*, the shape of the slenderly and obliquely pyriform seed being depended on to distinguish it. It is a widely distributed shrub west of the Sierras and Cascade Mountains, growing sometimes to a height of twenty-five feet, and extremely variable in the character of its pubescence. *Neillia Torreyi* becomes *N. monagyna*, this being the earliest specific name applied by Torrey to the species then thought to belong to *Spiræa*. The figure (the only one) published in GARDEN AND FOREST, ii., p. 5, is overlooked.

A fourth species, *N. malvacea*, discovered by Mr. Greene on the northern shore of Lake Pend d'Oreille, in northern Idaho, is here first described in a section created to receive it, and characterized by "carpels not inflated, included in the calyx, erect and straight at apex, indehiscent." The leaves are digitately five-veined, and often broadest above the middle. To this species Mr. Greene suggests that many specimens from Nevada, Utah and Montana referred to *N. monagyna* really belong.

Recent Publications.

Aspects of the Earth; A Popular Account of Some Familiar Geological Phenomena. By N. S. Shaler, Professor of Geology in Harvard University. Illustrated. New York: Charles Scribner's Sons. 1889. \$4.

A real service has been done the public by the issue in book form of the clear, trustworthy and interesting essays on various groups of terrestrial phenomena which Mr. Shaler first printed in *Scribner's Magazine*. They now form a connected treatise of much greater utility than its title suggests; for not only the present aspect but the past history of the earth is made plain, and from the data thus supplied prophecies are drawn which every man who owns an acre of ground or has a hand in legislation should study as guides for immediate action.

"The Stability of the Earth," "Volcanoes," "Caverns and Cavern Life," "The Instability of the Atmosphere," "The Forests of North America" and "The Origin and Nature of Soils" are successively discussed, man's relation to the world, thus explained, not being for a moment lost to sight. The practical character of the book is, indeed, its most distinctive merit. The chief fact it leaves impressed on the mind is the immeasurable importance of our forests from an economic and sanitary as well as scientific point of view. This could not have been more truthfully or lucidly set forth, nor could there have been a better moment for such an explanation. It ought to prove an efficient antidote to certain mistaken theories with regard to deforestation that have recently been promulgated, as it shows not merely how our water supply, but how our soils, vegetation and atmospheric conditions must be affected by the destruction of our forests. If it wins the popularity that seems in store for it, a great increase of national conscientiousness as regards forest legislation ought to be the result. Many of the points it emphasizes have often been brought forward in these columns; but as marshaled and commented upon by Mr. Shaler they will make a fresh impression even upon the most earnest and loyal of our readers.

Perhaps the most interesting chapter, because the most novel (it is the only one that has not appeared in *Scribner's Magazine*), will be the final one, on "Soils." Even those who know how likely the world is to be deprived within a calculable space of time of its carboniferous and metallic deposits and of its arboreal garment, seldom realize that it is in danger of losing the greater part of that layer of disintegrated rock and decomposed vegetable matter which we call soil. Fancy a world deprived of arable ground and we see a world in which man could not live. The lack of coal and metals he will probably be able to make good in other ways; the lack of forests might be repaired by a very slow process were the soil preserved; but the lack of soil itself could be overcome only by a process as inconceivably long as that which has put the earth in the condition in which we see it now. Yet only one-fifth of the arable lands of the world, as Mr. Shaler computes, are practically safe; four-fifths are in great danger, not only from deforestation, but from the agricultural methods now in use.

So great, indeed, is their danger, that Mr. Shaler considers the soil problem "perhaps the most serious of all the physical difficulties which beset the future of man." What is needed now is forest legislation, accompanied by a wise system of irrigation. What will eventually be needed is legislation to regulate even agricultural processes as simple and apparently innocuous as the annual overturning of the surface of a field by the plow. We must husband our water, we must husband our trees, and we must husband our precious layer of plant-feeding earth if future generations are to be fed at all. The great merit of the present book is that it shows not only the necessity of each of these efforts, but the vital interdependence of each upon the others.

Very charming reading is the passage (beginning on p. 268) where a virgin forest is described, the text being that great Appalachian forest of ours where "are still to be found, perhaps, the finest areas of virgin woods of the deciduous type that remain upon the earth;" where the trees "are of exceeding variety and man has as yet spared them the destruction which he is soon to inflict."

Except for the ill-drawn and ugly figure on the cover, the "Aspects of the Earth" is an excellent piece of book-making, and its illustrations are as illuminative as attractive. Mr. Shaler is too modest when he says that from the point of view of instruction they are the most valuable part of the volume; but they are worthy to accompany his text, and this is high praise. We have felt it a duty as well as a pleasure to call attention to a book which will interest every man who cares to look at the world he lives in, and will wake the conscience of all who feel they owe a duty to posterity.

Notes.

The original appropriation for parks and gardens, in connection with the Paris Exhibition, was 3,082,654 francs, or more than \$600,000.

According to the San Francisco *Examiner*, Mr. Adolph Suto is experimenting with Cinchona-trees on his estate on the neighboring sea-coast. He hopes to acclimatize at least some of the varieties from which quinine is produced; and if so, will doubtless be more than repaid for his enterprise.

We have received the July, August and September numbers of the Journal of the Japanese Horticultural Society. The first contains an excellent colored plate of *Eriobotrya Japonica*, showing a large, distinctly pear-shaped fruit, a form which does not occur on the plants cultivated usually in our southern states.

The prices recently quoted in the newspapers as asked for Christmas-trees in New York refer to the down-town markets, and give no real idea of those paid by purchasers up-town. In the vicinity of Jefferson Market from \$2 to \$4 were asked for good specimens not more than nine feet tall, and \$25 were demanded for the finest and largest trees, which reached thirty-five or forty feet in height.

Mr. Jackson Dawson observes that the fruit of *Berberis Thunbergii* is much relished by quail, although the birds do not eat the entire berry, but pick out the seeds only from their scarlet covering. This suggests the idea that this Barberry would be a good shrub to plant for game covers. The berries remain on the bushes all winter, and they might make excellent food in a season when little else could be found.

A correspondent of the *Journal des Roses* recently recounted an experiment he had made to test the influence of the stock on grafted Roses. Two lots of Roses, one grafted on *Rosa canina* and the other on *R. polyantha*, were forced under glass, both being treated in precisely the same manner. The flowers which stood on *R. polyantha* came into bloom two weeks earlier than the others and yielded twice as many flowers.

M. Von Volxem, the distinguished Belgian dendrologist, referring, in a private note, to our article on *Acanthopanax ricinifolia*, published on page 568 of volume ii., reports that this tree is hardy in Belgium, but grows so slowly that his plants are only a foot high at three years of age, in good soil; another instance to be added to many already known of east Asia deciduous plants growing better in eastern North America than in northern Europe.

A noticeable feature of the Christmas flower trade in Boston was that large, showy flowers were not sought for. Harris' Lilies and Callas found few buyers at any price, while long-stemmed Carnations, particularly flowers of the Grace

Wilder, were in great demand. The sales of "Christmas green" were larger than usual, and among the various kinds used there appeared limited quantities of the evergreen *Euonymus Japonicus* in fruit.

A Philadelphia correspondent writes that there is more call for American Beauty Roses than ever before, but even at high prices it is rarely a profitable variety to the grower. The Wootton has not been able to displace it in popular favor; but as the newer Rose is more profitable for growers, even at lower prices, it will force its way in the market. The Duchess of Albany, with its beautiful fresh color, is rapidly gaining favor, and buyers are already inquiring for Madame Hoste. Its delicate yellow shade and perfect shape recommend it to every lover of Roses.

The tops of young southern Pines (*Pinus palustris*), from Georgia or Florida, were conspicuous objects in the shops of New York florists last week. Stems of young, vigorous saplings four or five feet long, with the terminal cluster of leaves, are cut and stuck into flower pots filled with earth. As the leaves remain fresh for a considerable time, the cut stem has every appearance of a living plant. The long, bright green leaves and the white scales of the large terminal bud, which are peculiar to this tree, make the young plants ornamental and attractive objects, well suited for the decoration of churches, for which they are used principally in this city, or other large buildings.

The three Grand Prizes awarded at the Paris Exhibition for information with regard to "Useful and Destructive Insects" fell to Professor C. V. Riley and to the Agricultural Departments of the United States and Japan. Of the seven Grand Prizes awarded in the Section of Agronomy and Agricultural Statistics two fell to the United States Government and the Ministry of Public Works of Mexico. No Grand Prize for wine or viticulture was awarded to an American, but one firm in the United States received this recompense for beer. Eight such prizes were given for machines and processes connected with work in farm and forest (*Materiel et procédés des exploitations rurales et forestières*), and of these, two were gained by Americans—by Walter A. Wood and the McCormicks.

Dr. James C. White, of Harvard University, reports in the Boston *Medical and Surgical Journal* an interesting case of *dermatitis venenata* resulting from the use of the Garden Box. The patient was a young woman suffering from an attack of acute inflammation of the face, which was uniformly and greatly swollen, presenting generally the appearance of Rhus or Ivy poisoning. She had, it appeared, made a decoction of Garden Box and applied it to her scalp for the purpose of preventing her hair from falling out, and the liquid had run down over the face, which she had subsequently washed with the rag used in applying the liquid to the scalp. The inflammation, in spite of local treatment, had not disappeared at the end of six or seven days from the time of the application. Dr. White, who is a distinguished authority on *dermatitis venenata*, remarks that this is the first case of poisoning by Box which has come under his observation, although the poisonous properties of the plant have been suspected for many centuries, as it belongs to a family containing violent and cutaneous irritants, such as croton oil, manchineel stillingia, and the oils of *Fathorpha urens* and *Hura crepitans*.

The "flower festivals" of the Japanese are often referred to without clear explanation of their number and character. Five are annually celebrated. At the New Year's Feast, on the first day of the first month, the chief plants used are Bamboos, Firs, *Prunus Mume* and *Adonis Amurensis*. The first two are set by the house-door, and the others are displayed in the living-room. At the second, or "Girls' Festival," which is held on the third day of the third month, *Prunus Persica* is the favorite plant. At the third, or "Boys' Festival," on the fifth day of the fifth month, one sees chiefly the Shobu (*Iris laevigata*); while at the fourth, or "Ladies' Festival," on the seventh day of the seventh month, no flowers are favored, but songs are written on bits of paper fastened to leafy stalks of Bamboo and set on high in the garden. The last feast occurs on the ninth day of the ninth month, and then the Chrysanthemum is honored by old and young alike. These various celebrations have always been held in accordance with the dates of the old national calendar; but now that the Gregorian calendar has been introduced, it is found difficult to procure the proper plants on the proper day. The great imperial feast in honor of the Chrysanthemum has no special time set for it, but is held whenever the flowers in the Emperor's garden are in most perfect condition.

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The Forests on the Public Domain.

THE address by Major J. W. Powell, Director of the United States Geological Survey, before the Chamber of Commerce of this city, on December 5th, on "Problems of Irrigation," was an eloquent and suggestive discourse. He explained that there are nearly a thousand million acres of arid lands in the United States, or one-half of the area of the country, excluding Alaska. Nearly one hundred and twenty million acres can be irrigated when all the available water is used. More than six million acres are already cultivated by means of canals. The great resource for irrigation is the use of the rivers, and accumulated capital and organized industry are necessary for the construction of reservoirs and other works required. "Capital must come, for the work is demanded and will pay." He thinks it will cost about ten dollars an acre to redeem the arid land, and fifty dollars an acre he regards as a small estimate of its value after it is put under irrigation, and thus the investment of a thousand millions of dollars will yield five times that sum by the redemption of a hundred millions of acres. Where agriculture depends upon irrigation, if there is more land than the water will supply, values inhere in water, not in land, as land without water is without value.

The arid land, he said, is now mostly in the possession of the general Government, and it is important to determine how the water shall be divided. When all the water of the Arkansas River is utilized it will irrigate only about one-third of the land of the valley. The people of Kansas want this water, and say it should be left in the river channel till it runs down to them, and they are using some of it, and the people of Colorado have taken a large part of it out on their lands. When seasons of drought come they permit no water to flow across the state line, and the agricultural property below is threatened with destruction. If every man may take out water as he pleases, the men along the river below are at the mercy of those above them. This is an inter-state problem to be settled by the general Government. Already there is conflict between farmer and farmer, between different counties and between states.

In Major Powell's judgment, the foot of the steep slopes, the point at which the river enters the plain, is the place at

which the water should be taken from the river channel for irrigation. If permitted to flow farther down much of it will be lost by evaporation, and it will take up mud which will choke the reservoirs. The general Government should determine where these waters are to be used, and should exercise supervision in this matter when it disposes of its lands to actual settlers, taking into account the welfare of the greatest number of people yet to find homes. Montana and the two Dakotas are interested in the water of the upper Missouri, and there is not enough for all the arid land of the valley. How shall it be divided? The Rio Grande del Norte is, in a part of its course, the boundary between this country and Mexico. The division of its water is an international question.

We quote from a noticeable passage on mountain forests:

"On the mountains and plateaus of the arid lands great forests are found. To a large extent they are composed of coniferous trees—Pines, Firs, Hemlocks and Sequoias. The plains and valleys below, where agriculture by irrigation is to be carried on, are treeless and almost naked of grass. The forests flourish where the rains fall in the regions above, but these forest lands are not agricultural for climatic reasons, as snow and frosts prevent farming in those regions. It is thus that the forest lands and the agricultural lands are severed. They are often far away from each other—tens, scores and hundreds of miles apart. The people below on their farms, and in their villages and cities, require this timber for their domestic use, and they are the people primarily interested. But these farmers have still other interests in the forest lands. The mountains where the forests grow are the catchment areas for the waters which they must use, and, to a large extent, the mountain lakes are natural reservoirs for the waters of irrigation, and many of the mountain valleys must be converted into reservoir lakes by the hand of man. So the management of these forests and forest lands should be in the hands of the men who use the timber and who must control the waters. If they are unwisely destroyed, the sources of water supply are impaired. Consider how these forests are destroyed. More than two decades ago I was camped in the Middle Park, of Colorado. The night was arched with the gloom of snow clouds, so I kindled a fire at the trunk of a great Pine, and in the chill of the evening I gazed at its welcome flames. Soon I saw it mount, climbing the trunk, crawling among the branches, igniting the rough bark, kindling the cones and setting fire to the needles, until in a few minutes the great forest Pine was all one pyramid of flame, which illuminated a temple in the wilderness domed by a starless night. Soon the fire flakes were borne by the winds to other trees, and the forest was ablaze. On it spread with the winds, and the lingering storm came not to extinguish it. Still on it swept for miles and scores of miles, until more timber was destroyed than has been used by the people of Colorado for the last ten years. It is thus that, under conditions of civilization, the great forests of the arid lands are being swept from the mountains and plateaus.

"The people of this country, witnessing this vast destruction of values and the deterioration of the water sources of arid lands, are appealing to the general Government for a Forestry Commission—the establishment by law of armies of men to protect the forests, and they propose that the general Government shall engage in timber culture and in the timber business, holding the lands in the possession of the Government and selling the timber to the people who live below. For this purpose thousands and scores of thousands of men will be needed, a formidable list of offices must be created, and office-holders multiplied.

"The great forests that clothe the hills, plateaus and mountains with verdure must be protected from devastation by fire and preserved for the use of man, that farms may be protected and homes built; and that all this wealth of forestry, those unborn cottages and school-houses may be distributed among the people."

How is all this to be provided for? Major Powell says to the general Government, "Hands off!" He would organize the people of each river drainage area, or hydrographic basin, into a great irrigation district, under national and state laws, and then let them make their own laws for the division of the water, for the protection and use of the forests, for the protection of the pasturage on the hills, and for the use of the water-power:

"This, then, is the proposition I make: That the entire arid region be organized into natural hydrographic districts,

each one to be a kingdom within itself, for the purpose of controlling and using the great values which have been pointed out. . . . The plan is to establish local self-government by hydraulic basins, and each basin may constitute a great country. Some great river basins would have to be divided into two or more districts. . . . Let the people of the district provide their own officers for the management and control of the water, for the protection and utilization of the forests, for the protection and management of the pasturage, and for the use of the power, and with district courts, water-masters, herders and foresters, they would be equipped with the local officers necessary for the protection of their own property and the maintenance of individual rights. The people of each little kingdom, or separate hydraulic basin, can obtain capital by their own enterprise as a community. Constituting a body corporate, they can tax themselves and can borrow money. For security they have a basis of land titles, water rights, pasturage rights, forest rights and power rights."

But now comes a curious proposition:

"Let the general Government make a survey of the lands, segregate and designate the irrigable lands, the timber lands, the pasturage lands and the mining lands; then let the general Government retain possession of all but the irrigable lands, but give these to the people as homesteads. Then let the general Government declare and provide by statute that the people of each district may control and use the timber, the pasturage and the water-powers under specific laws enacted by themselves and by the states to which they belong."

What would be the advantages of having the nation retain possession, in name only, of the mountain forest-lands if the people of the valley are to control and use the timber on the nation's lands as they please, without supervision by the national Government, and without any responsibility to national authority? If the nation is to "retain possession" of the forests, it should have some control of its own property. On the other hand, if the people of each irrigation district are to have entire control of the mountain forests about the sources of the streams, the nation's title should be extinguished and the forests should be owned by those who are to have complete control of them. It would then be easier to educate the owners in sound ideas regarding the functions and value of the forests, and there would be more chance of their some time learning to take care of them. At present millions of people have a special appetite for pillaging public property, and if the forests belonging to the nation are to be left without defense to the uncivilized impulse and caprice of the new communities, there should be no pretense that the nation retains possession, as under the proposed system it would have no power or right to defend or protect this invaluable forest property. Responsibility should rightly go with control, and if the local community is to have complete control, its responsibility for the fate of the forests should be brought home to it in the plainest possible way.

What is really desired by intelligent men who are interested in the relations of the forests on the public domain to the national welfare is that the nation shall examine its magnificent forest property, and ascertain its character and extent before making any final disposition of it. Why should the Director of the National Geological Survey oppose the appointment of a competent commission to make such an examination? The country would not be obliged to adopt any recommendation of the commission, but the knowledge obtained by its investigations would be the best preparation and basis for right action. The facts regarding the forests on the public lands which the officers of the Geological Survey have been able to observe during their absorbing labors in their own field are highly interesting and valuable; but there has been no adequate examination of this important national property. Until such an investigation has been made, and the facts have been placed before the people of the country, no settled or final policy regarding these forests can be intelligently adopted.

In this important address the fundamental truth that the forests which are the subject of discussion are the property of the nation, of all the people of the United States, is recog-

nized indeed, but without developing it, or indicating its relations to national responsibility. It is most important that we should properly estimate the opportunity which national ownership presents for surrounding this invaluable national property with such safeguards as may appear judicious or practicable when we have ascertained what our heritage is. The forests and the lands of the public domain belong to the people of this state as much as to any other local community. The nation holds this vast wealth in trust for future generations. It should ascertain its nature and extent, and then determine wisely what arrangements will be best adapted for its permanent administration.

Down the Rhone.—I.

NORMANDY, Brittany and the coast near Nice are familiar parts of France to the American tourist, and the Loire Valley, like Picardy in the north-east and a portion of the Pyrenean region in the south-west, are not unknown to him. But who travels in the great central district that stretches from the Bay of Biscay to the German frontier, and from the shores of the Loire to the skirts of the Pyrenees? It is incomparably beautiful, all this great stretch ignored of the foreigner, and its beauty varies strangely with every journey one may make—changing from volcanic majesty to pastoral loveliness, from a rocky, wooded picturesqueness to the southern charm of wide green plains, set about with naked masses of yellow hills. But no part is more delightful than the valley of the lower Rhone, and this is the very part that is most seldom seen. Of course the Rhone Valley is constantly traversed by rail, but the journey is usually made in winter, and even in summer one cannot really see it from the train—not even so well as one can see the Rhine; for the road seldom keeps close to the bank, and often one would not guess the great river's existence.

Fortunately, before we started on a long French journey last summer, we fell in with certain artists who had once gone down the Rhone in the proper way by accident—for cheapness' sake, uninformed of all the increase of delight that the diminution of expense would mean—and who had since gone about, usually in vain, trying to persuade others to do the like. So we found ourselves in the middle of July starting on a Rhone voyage from Vienne, a little way below Lyons. Vienne itself is well worth seeing. It is perched on the high eastern bank, and has crooked old streets, quaint little churches, Roman ruins, and a cathedral whose façade has been eaten by centuries of river breezes almost into the likeness of a sponge, but is still superbly effective at the top of a stately terraced stair. The drives along the river are enchanting, too. When the boat, which starts from Lyons an hour earlier, swept into view at 8 A. M., we saw a long, narrow steamer, piled high with freight, and full amidships and at the stern with peasants going short distances down the stream. No one travels here for the sake of traveling—the only purpose of the boat is to serve local traffic—so that stops are made at every village. But this fact merely adds to the interest of the trip, and it means, furthermore, that one has to one's self the space in the bow which is reserved for possible first-class fares. We were all alone on our July day, except for a single Frenchman who was showing his daughter the river, on one of their frequent visits to their family in the south; and does this not sound pleasant to the reader who knows what the tourist crowd on a Rhine steamer means?

Yet the Rhone, if one could not see both, is better worth seeing than the Rhine, and not merely because one is proud to be "doing" something that all the world has not "done" before him. The glimpse of its beauty which we had while driving about near Vienne almost persuaded us to think as much, and the further we went, the more we believed it. Do you fancy the landscape flat and monotonous? There is no place between Lyons and Avignon where mountains are out of sight, or where there is more flat land than serves to make beautiful fertile plains in admirable contrast with the rocky yellow hills that encircle them. Are there ruins and picturesque churches all along the Rhine? So there are here, in even greater numbers, in much greater variety. Do you delight in picturesque villages? You have never seen them till you have seen what they mean on the Rhone. If there are no crags so bold and rocky as one sees in the Lorelei region of the Rhine, there is an endless succession of superb rock-forms more suave in contour, far more lovely in color—yellow almost always, touched with spots of dusky foliage, and passing into the softest tones of white and gray. Then,

between the rivers as such there can be no comparison. The Rhine seems a poor stream contrasted with this wide, arrowy Rhone, so full that it has to be dyked in here and there with masonry, and that even in midsummer the water rushes up close to the top of the embankment; so swift in its fullness that the boat's speed is most exciting, and when we pass beneath a bridge there is a roar like that of a cataract; the most charming color, too—a sort of pale greenish gray that turns all sorts of tints with the varying light, and seems to breathe the coolness of the distant, perennially feeding glacier. For form one may easily prefer the Rhone landscape to the Rhine landscape; in color it is immeasurably ahead; and if its historic interest seems less, this is only because we are as oddly ignorant of French history as of the aspect of France. Speaking materially, too, this voyage is the more delightful. The mere absence of tourists means great comfort for body and mind, and even on this little provincial boat French skill provides food for the daintiest palate. The weather may be hot sometimes, but hardly as Americans use the word; and on our July day it chanced to be too cold in the morning, and even when we got far south was rather cool than warm. But what seems to me the very best thing about the Rhone remains to be told. It does not always show us varying forms of the same type of landscape, but takes us from what is almost the north into what is truly the south. As we watch its banks we see the character of land and vegetation changing; architectural features lose their northern and take on their southern shape; the light grows clearer and stronger; color gets ever more and more intense. We start at Lyons and we end at Avignon, and there is almost as much difference in the names as though we had said bluntly "North" and "South," and, again, as though we had said the modern and the mediæval world.

As we left Vienne there was just behind us the great bridge which connects it with the picturesque suburb of St. Colombe; the shore was fringed with scattered factories, looking not unpicturesque amid groves of tall Poplars and against a background of hills delicately tinted by the misty morning light; and, in front of us, under great banks of gray cloud, there looked to be no river, but a great lake, for there is a bend to the westward about a mile away, and hills of beautiful outline stretch across the southern sky and hide the course of the water. But as we rushed off to the right—getting our first taste of the motion, which is sometimes a rush, sometimes a long, smooth, swallow flight and sometimes a swirl that feels like incipient shipwreck—our course opened out again, with a bit of flat land on the left and rounded hills on the right, with densely wooded hollows between them. Quickly we take an abrupt turn in the opposite direction, and the stream seems blocked again by a low hill at the foot of which four giant Poplars stand up above their fellows like giants to take toll. Then on the west, as we round the point, is the village of Condrieu, where we make our first stop. The boat is warped up to the high water-wall only by all the force of reversed engines and scores of sturdy arms, so relentless is the rush of the river. Every such stop is a new excitement—much cheerful noise on shore and the feeling on board that the boat will never be brought to its place.

Condrieu is very picturesque, the low, tiled houses, whose stones show through the thin, brownish-white plaster crowding close on top of the wall, with vine-clad loggias and masses of pink and white Oleanders between them. The roofs are dull brown, and the cornices of that simple, cheap yet effective kind which is common all through central and southern France. Several rows of concave tiles are laid with the hollow side down, each row projecting beyond the one beneath it, and the interstices filled with plaster, against which the tiles show in pretty scalloped lines. Here, too, we saw our first Fig-trees, while Mulberries abounded, and back of the village were endless rows and groups of slender Black Poplars, with an occasional more massive Lombardy. Lindens and Horse-Chestnuts clothed the outskirts, and just below the town the hills were covered with vineyards. The river winds continually below Condrieu, showing us blue mountains far off to the west, and here and there a square church tower that seems as appropriate to the landscape as does the spire in Normandy. Stone dykes are frequent and not only in the neighborhood of the towns; and where there is no dyke, Poplars and Willows come close to the edge. Near St. Pierre-de-Bœuf is a light suspension bridge—I think the one that Dumas speaks of in his "Voyage dans le Midi de la France" as the first that had been built in the country. Flat, fertile plains occur, but always bordered by hills, and I remember one little town where a rough stone church had buttresses and capitals of white stone or marble, adding the gayest of notes to the picture. Pollard Mulberries run in long lines between the fields, and some-

times the near hills lie in low, gentle waves like sea water charmed to rest. It is all incomparably picturesque—not with the jagged, irregular picturesqueness we know in the north, but with a suave and gentle modulation that, perhaps, better deserves the term pictorial. The Rhine may more greatly attract an uneducated eye—there is no artist who would not prefer the softer majesty of the Rhone shore. Harmony is the word that always comes to mind—never a discordant line, never a crude tint, yet what variety in line, what warmth and richness of color! When the clouds veil the sun a little and Poplars and Willows are most numerous and come closest to the stream, one gets a succession of "Corots" as complete and exquisite as ever came from the master's brush. Perhaps one of the most charming forms the shore assumes is when rather steep yet rounded hills lie with their deep yet gentle valleys at right angles to the stream, and, while the hills are clothed with vineyards or dotted with low, gray shrubs, the vales are filled with forest.

At Serrières is a new stone bridge with one of its piers, something like a Brooklyn bridge pier on a smaller scale, set close against the flank of a high green hill. The water-wall is in two high terraces, and some of the houses have a strangely military look, being formed of two round towers with a "curtain" of wall between, their brownish stone and stucco coming out effectively over the Corot-like foreground of pale gray water and foliage. Near Sarras the hills were high, close to the stream and uncultivated, the rocks cropping through their flanks amid a scattering of grass and low brush. There is a bridge with three towers here, and factories of rough stone with brick trimmings, ugly, yet not actually distressing to the eye. Beyond the town, on the naked hill-tops, were three "calvaries," or great crucifixes for way-side prayer, gilded and shining from afar. Then came cultivated hills again, varied by broad patches of rough soil; and soil and houses together grew yellower and yellower, and spoke more and more plainly of the coming south.

New York.

M. G. Van Rensselaer.

Holiday Notes in Southern France and Northern Italy.—X.

A few miles westward of Mentone, on a coast abounding in sites of matchless beauty, we come to Monaco, the capital of a principality interesting from many points of view, historically and otherwise; in size, however, the entire realm is less than many and many an English parish. The mountains protecting the coasts from the chilling northern blasts are only of moderate height, but are very picturesque, and their proximity adds another charm to Monaco, the beauty-spot of the Riviera. The gardens of Monte Carlo have been frequently described in horticultural journals—British and continental—but they contain so many objects of interest to the botanist and gardener and furnish such a series of contrasts and surprises that accounts of them have not yet ceased to charm the plant lover. Fancy the sensation of a northern gardener on seeing, side by side with the common Weeping Willow, big bushes of *Datura* (*Brugmansia*) *suaveolens* laden with their large white trumpets; then the Bougainvillea and the Cherry Laurel—perhaps the most widely planted evergreen in the British Islands—the scarlet-flowered *Tecoma Capensis* and some hardy Silver Fir. Examples of shrubs, etc., hardy in Britain and the northern United States, luxuriating with denizens of tropical countries which we had never seen previously except under glass, are too numerous to mention.

Untraveled readers who can refer to the *Gardeners' Chronicle* for 1874 are invited to turn to pages 820 and 821; there they will find an excellent illustration of the town of Monaco and another of a view in the gardens at Monte Carlo. The capital of the little principality is perched on a precipitous mass of rock which juts out into the Mediterranean. Scarcely a greater contrast can exist than that between the garden of the last-named city and the one in the neighborhood of the Casino at Monte Carlo; in the former case there is an absence of anything savoring much of artificiality—walks wind about under the shadow of the Pines (*P. Halepensis*), while Agaves and Opuntias, Mesembryanthemums and other succulents have thoroughly naturalized themselves, particularly on the seaward side, where they brave the sea breezes in spots inaccessible even to goats. The beauty of the scene here was not lost on Prince Florestan, who describes "the tall Palms, the giant Tree-Geraniums (Pelargoniums) blooming in masses down the great cliffs to the very edge of the dark blue sea, the feathery Mimosas (Acacias), the graceful Pepper-tree (Schinus), laden with crimson berries, the Orange-grove, the Bananas fruiting and flowering at the same time, the Passion-flowers climbing against the rugged old castle walls, etc."

The underwood beneath the Pines is almost entirely composed of scarlet Pelargoniums—great bushes three or four feet high—masses of bloom and growing as freely as brambles in a thicket; not even at the Cape of Good Hope can they be more luxuriant or splendid.

In the old garden nature has done much and art comparatively little; in the Monte Carlo garden the aid of the landscape gardener has been invoked, and to some purpose too. Near the Casino itself stately terraces have been made in harmony with the lines of the building erected nearly ten years ago by Garnier, the architect of the new Paris opera house. At the same time Monsieur Edouard André remodelled all the gardens, which are now said to be amongst the most beautiful in the world. The combined attractions of roulette, the lovely site and gardens and excellent music—the orchestra is world-renowned—render Monte Carlo a very popular resort, and the extensive additions, on which an army of men were employed, did not, on the part of Monsieur Blanc, seem to indicate much fear that the opponents of gambling would soon succeed in their efforts to get the tables suppressed.

Of course Palms play a great part in the Monte Carlo landscape; the Date-Palm attains a large size, so does the Chusan Fan-Palm (*Trachycarpus* [*Chamerops*] *excelsus*). The Mediterranean Fan-Palm (*Chamerops humilis*) is useful for massing, and varies greatly in size, length of leaf-stalk, the character of the spines thereon, etc. During winter its mass of orange colored fruits form a dense collar round the stem at the base of the crown and produce a fine effect. *Washingtonia filifera* is abundant, and the Silver Palm—*Erythraea armata*, or, as it is everywhere called along the Riviera, *Brahea Ræzii*—a Mexican species, makes a most beautiful object; it is, however, usually grown as a single specimen on lawns, not yet being common enough to plant in groups. *Cocos flexuosa*, very fine plants, some thirty feet high, with their splendid plume-like leaves and smooth stems, make a most attractive feature. *C. Fatai* and *C. Blumenavii* are two of the many names under which the Brazilian *C. capitata* is grown. Sabals exist too under garden names, and Palm nomenclature along the Riviera is, on the whole, in a very sorry state. It is quite impossible to clear up the confusion surrounding the genera Phoenix, Cocos, Sabal and others unless some careful observer studies all the so-called species in a living state under conditions favorable to their development; and for this many spots along the Riviera supply a suitable environment.

Cycads are not strongly represented at Monte Carlo. There is on one of the lawns a fine *Dioon edule*, and elsewhere a big specimen of the Caffer Bread, *Encephalartos Caffer*. *Cycas revoluta* was the member of this family most frequently met with both here and elsewhere. Bamboo-groups produce beautiful effects; many species of these noble grasses exist under garden names only, and until they flower it is impossible, in many cases, to determine with certainty even the genera to which they belong. Some of the Bamboo-masses had a forest of stems thirty feet high or more.

One pretty effect was produced by a Pine heavily draped with the small-leaved climbing Polygonaceous plant (*Muehlenbeckia complexa*). In the same way *Trachelospermum* (*Rhynchospermum*) *jasminoides* was used to clothe the stems of large Date Palms. *Phytolacca dioica* here makes a tree in a remarkably short time, and is effective enough. A few years ago a Cape dealer made a good hit—from his point of view only—by selling young plants of this, as a timber tree of wonderfully quick growth, to the south African-colonists. The India rubber-tree (*Ficus elastica*) makes a huge specimen at Monte Carlo and develops adventitious roots quite in a tropical manner; the Australian *F. macrophylla* does equally well. One of the handsomest flowering plants I saw was a Solanum called *S. Rantonetii*, a species with round, shallow, saucer-shaped flowers, with deep violet flowers and golden anthers; and *S. glaucum*, a dozen feet in height, was also finely in flower.

Grevillea robusta, so much used in a small state for room and conservatory decoration in England, here makes a good tree. Of course the names of a large number of plants previously noted by me in these columns are not repeated here, and unfortunately, lack of space prevents my dwelling longer on Monte Carlo.

At the beginning of September the bush Roses had all been cut back and some had already broken. The ground at the same date had been roughly turned up previous to raking and leveling, treading firm, etc., and sowing with English Ryegrass; in this hot, dry region it is next to impossible to keep grass alive, and it is only where labor and water supply are abundantly and constantly employed that lawns can be kept

green during the summer and autumn months. The general practice is to sow them annually.

La Condamine, on the little plain between the promontories of Monaco and Monte Carlo, connected with both places by splendid roads, can boast of a very fine line of *Nerium Oleander*, the large double-flowered form. The trees have clean stems of six or seven feet, and good heads, which were covered with blossoms at the time of our visit.

Kew.

George Nicholson.

New or Little Known Plants.

Hydrangea vestita, var. pubescens.*

THIS Hydrangea (Fig. 3, p. 17 of this issue) is one of the handsomest of the numerous shrubs which have found their way of late years from China and from Japan into our gardens. A native of the mountains of northern China and of Mongolia, it is not believed by M. Maximowicz to be specifically distinct from the Himalayan *H. vestita*, a small tree, of rather wide distribution. Here the north China plant makes a graceful shrub, four or five feet high, with slender branches covered with red-brown bark. The leaves are pale green and rather velvety on the upper surface, ovate-acute at both ends, or sometimes somewhat rounded at the base, coarsely glandular-serrate, three and a half to four inches long, borne on stout petioles, cinereous-pubescent, and slightly rugose on the lower surface, as are the young shoots, the petioles and the inflorescence.

The cyme of flowers is flat and ample, with numerous neutral ray flowers an inch or more across when expanded. These open early in July, and are then creamy white; they gradually change to rose color, and remain quite fresh upon the plants until November.

This plant is perfectly hardy. It is the first of the Hydrangeas to flower, and the most desirable as a garden-plant of all the species which are hardy in this climate, with the single exception of the Oak-leaved Hydrangea (*H. quercifolia*) of our south Atlantic States.

The specimens in the Arboretum were raised from seed sent several years ago from Pekin by Dr. Bretschneider, to whom we are indebted for a number of fine hardy plants.

C. S. S.

Foreign Correspondence.

The New Plants of 1889.—I.

THE new plants introduced into English gardens during the present year are few when compared with the record for previous years. This is the more surprising when we recollect that many more collectors are at work now than ever before. Apparently these men are engaged in collecting and dispatching to England large quantities of standard or favorite plants, chiefly Orchids, for which there is a large and constant demand. Few nurserymen, including even those who, until recently, were identified with new plants of all kinds, appear to pay much attention to the introduction of anything except Orchids. Now and then a good plant finds its way to England to be taken care of and afterward distributed, but this appears to be oftener the result of accident than of design.

The botanical explorations of such men as Dr. Henry in northern China, the Abbé David in northern China and Mongolia, and the Abbé Delavay in the western province of Yun-nan have resulted in the addition of a few good plants to our gardens, of which more will be heard in the course of time; but these are mere scraps as compared with the riches revealed in their botanical collections. The preparation, packing and trouble necessarily attendant on the safe introduction of living plants into Europe from such countries as those named must deter many from attempting it, and yet to any one acquainted with the many means, such as seeds, bulbs, tubers, etc., at the disposal of those who are in unknown regions, the pity of missing the opportunity is great. Even such a journey as that recently accomplished by Mr. Stanley must have afforded a splendid chance for a collector with his wits about him. That a great deal can be done at such times has been proved again and again, notably by Dr. Aitchison when with the Afghan Boundary Commission, and before that, during the Afghan war; for, notwithstanding his official work, the energetic doctor collected

* HYDRANGEA VESTITA, var. PUBESCENS, Maximowicz, Mem. Acad. Sci., St. Pétersbourg, 7 série, x., 10.—Franchet, Pl. David, i., 124.
H. PUBESCENS, Decaisne, Fl. des Serres, iv., t. 378.—Gardeners' Chronicle, 1884, t. 107

Fig. 3.—*Hydrangea vestita*, var. *pubescens*.—See page 16.

seeds, tubers, bulbs, stems, etc., of all kinds of plants, as well as his specimens for the herbarium and animals and birds. The plants, etc., came to Kew, and many good and interesting things were raised from them.

In the following notes only those plants are noticed which have been distributed or which have flowered and have been noticed publicly in England. Many plants introduced this year are in the collections at Kew and in other botanical gardens and nurseries, but they cannot yet be looked upon as estab-

lished. It will also be noticed that plants which have been introduced a number of years, but have not flowered and been authentically named until this year, are included as new.

Plants not possessed of any value for horticultural purposes are not included, though a few plants of economical importance have been brought into notice during the year. Probably the most valuable of these is the true Sisal Hemp (*Agave rigida*, var. *Sisalana*), which promises to be a source of considerable profit where it can be cultivated on a large scale.

ORCHIDS.—There is a constant, steady influx of new species and varieties of Orchids, but amongst them are only very few of exceptional value in a horticultural sense. The best of the lot is *Vanda Kimballiana*, introduced by Messrs. Low & Co., and flowered for the first time by them in September last. Although allied to *V. Amesiana*, it is, nevertheless, abundantly distinct in foliage and in the form and tints of its flowers. (For a detailed description of this plant see GARDEN AND FOREST, vol. ii., p. 499.) Although not yet flowered in this country, the large quantities of those two reputedly very beautiful species of Madagascar Phaiuses—namely, *P. Humblotii* and *P. Henryi*—which have been imported by Messrs. Sander & Co., must be recorded here as an event of some importance to Orchid-growers. They appear to thrive under cultivation, and are likely to prove better garden Orchids than their delicate, though exceedingly handsome, relative, *P. tuberculosus*. At any rate the two new species are growing remarkably well in a moist hot-house at Kew. *P. pauciflorus*, with white flowers springing from the nodes of an elongated stem, is a recent addition from Java, whilst in *P. Mannii*, which is probably a very fine variety of the old *P. Wallichii*, we have a very ornamental, easily grown Orchid, much superior to all of that section of the genus represented by *P. grandifolius*. It was introduced to Kew from Assam, and flowered for the first time this year. *Grammatophyllum Measuresianum* is a provisional name for a vigorous growing, large flowered species, recently imported by Mr. Sander from the Philippine Islands, and described at length in GARDEN AND FOREST, vol. ii., p. 524. The plants of this genus are not happy, as a rule, under cultivation here, but in this respect *G. Measuresianum* is exceptional, as it grows very freely in a hot, moist house. *Catasetum*, a genus which is now receiving much more attention than formerly, has been strengthened this year by the addition of *C. Darwinianum*, *C. Bungeothii*, var. *aureum*, and *C. galaratum*, var. *pachyglossum*. These are all sufficiently ornamental to appeal to any taste that is not confined to the big and the gaudy. *Lælia autumnalis*, var. *alba*, *L. præstans*, var. *alba*, and *L. anceps amabilis* are all albinos of great beauty. They are the only new additions this year to the *Lælias* and *Cattleyas*, a surprising fact, seeing how numerous the new discoveries in these two genera were until a year or so ago. The only new *Odontoglossum* is *O. Hunnewellianum*, which has bulbs and leaves similar to those of *O. crispum*, whilst the flowers are two inches across, the sepals lemon-yellow, spotted with chocolate, the petals cream-white, spotted with purple and brown, and the incurved fimbriated lip is primrose-yellow, with a blotch of red-brown. It was introduced by Messrs. Sander & Co. from Colombia. *Oncidium Widgreni* and *O. fimbriatum* are botanical additions, as also is *Schomburgkia lepidissima* and *Eulophis bella*. *Cypripedium* has not increased in the number of species, two good varieties of *C. insigne*—namely, *Halleianum* and *Horsmanii*—being the only additions recorded. *Habenaria Macowaniana*, *Satyrium membranaceum* and *S. princeps* are introductions from south Africa, with considerable claims to favor were they not so difficult to manage after the first year. *Disa tripetaloides* is a large flowered, beautiful species, introduced by Mr. O'Brien from south Africa, and which promises to become as valuable in gardens as *D. grandiflora* and the recently introduced *D. racemosa*. *Peristeria Rossiana*, a new Reichenbachian species, with pseudobulbs and leaves like those of *P. pendula*, and flowers like the last named in color and size, but differing in the form of the column and lip. *Zygopetalum lucidum* is a new species imported from British Guiana by Messrs. Sander & Co., and is not very dissimilar from *Z. meleagris*. A few other new introductions of purely botanical interest have been noted, but they are not worth including here. It will be seen, therefore, that on the whole we have added very few good Orchids to those which we possessed last year.

GARDEN HYBRIDS.—If we have exceptionally few additions of any value to record among species and varieties of Orchids, those which have been produced by the breeder and flowered this year for the first time are interesting, and a few are valuable. Probably the finest Hybrid Orchid hitherto obtained in England is *Lælia Digbyana* × *Mossia*, raised by Messrs. Veitch and exhibited in flower before the Royal Horticultural Society, who awarded it a Banksian medal. It combines the most striking characters of its two parents in such a manner as to be very much superior to either. Other hybrids, raised from *Lælia* and *Cattleya*, are: *Cassiope* (from *C. Exoniensis* and *L. pumila*), resembling *L. pumila* in size and color, but not much of an advance (Veitch); *Aurora* (from *L. pumila* and *C. Loddigesii*), a beautiful little hybrid with flowers of good substance, intermediate in size and color between the two parents (Veitch); *Stella* (from *L. crispa* and *C. elegans*), a

decidedly handsome hybrid with the habit of *C. elegans* and the color of the flowers a modification of both parents (Veitch). In *Cypripedium* there have been numerous hybrids and crosses flowered and named during the year. Selecting only the most noteworthy, we have *Niobe*, mentioned last week, a beautiful little plant, as are all the offspring of *C. Fairreanum*; *C. Pitcherianum* (from *C. Harrisianum* and *C. Spicerianum*), described by Reichenbach in January last as “a surprisingly gorgeous flower, not only excellent in color, but also in its uncommon size.” It is dedicated to Mr. Pitcher, of New Jersey, and was flowered in the Sanderian establishment. T. B. Haywood is the only other new hybrid *Cypripedium* of any importance. It was raised in Messrs. Veitch's nursery from *C. superbiens* and *C. Druryi*, and partakes largely of the first named parent. *Cymbidium eberneo-Lowianum* is a hybrid whose parentage is denoted by its name; it was raised by Messrs. Veitch and received a first-class certificate from the Royal Horticultural Society. Several Hybrid *Dendrobiums* and *Masdevallias* have flowered, but they are not worth mentioning here.

London.

W. Watson.

Cultural Department.

Orchard Experiences.—I.

IT is the habit of nearly all branching species of trees, when allowed to develop naturally, to branch from the ground up. When man, for his own ends, counteracts this tendency by the use of the knife, he does it at the expense of growth and of a greater or less detraction from the health of the trees so mutilated. Of course, this truth is not conclusive against pruning, for, in the forest, very straight timber requires the sacrifice of lateral development in the trees, and the requirements of practical convenience in our orchards justify the removal of obstructive growths. And yet we should never quite ignore the fact that even the most scientific maiming of our trees is in some sort a cruelty, which has its inevitable reaction.

The admission by all skilled tree-growers that disbudbing, or penknife pruning, should be the rule, is an acknowledgment of the truth above stated. If we must do harm to the tree for our own future advantage, let us at least do it in the least harmful way. Nothing so quickly destroys a plantation of fruit-trees as the rude pruning with axes which is too often seen in American farmers' orchards, while the scarcely better pruning away of large branches with the saw is working even wider destruction.

It has been my fortune to be an orchardist below the latitude of thirty-eight degrees and on that of forty-five degrees. In the former the evils of rash pruning are far less conspicuous than in the latter, but they are by no means inconspicuous. In the cold north a roughly pruned young tree soon perishes. This fact has led to the hasty advocacy of a let-alone practice; and it is admitted that by it a great deal more fruit will be obtained while the trees are young. But as they grow and their heads become a mass of tangled brush, with the lower limbs and many of the inner ones dying for want of air and light, Nature prunes for us, and, in spite of us, does it more roughly and with more destructive consequences than we should have done it ourselves, however careless or ignorant.

Briefly, then, we are reduced to an alternative choice either to train our trees or let Nature do it, and Nature is very “careless of the single life,” which, in every case, it is our profit to preserve.

The absolute necessity for as nearly iron-clad fruit-trees as possible in the extreme north is demonstrated in nothing more impressively than in our attempt to form an evenly balanced and suitably open head for our orchard-trees. These attempts are sure to fail if the tree is not hardy enough against climate to bear the exposure—not so much to the cold as to the sun's heat and light. A great deal of emphasis is put upon setting the young trees at an angle leaning toward the prevailing winds of the leafy season, and I accept this as good practice everywhere. But as it is in the bare season that the sun's rays work the most damage upon the trunks, the forks and the limbs of our trees, it is not enough.

The prime essential of our northern orchard-practice is to get a sound, sun-resisting trunk; and the varieties which will give us that must be the foundation of our work. We find these chiefly, if not exclusively, among the trees of north-eastern Europe. Upon them we may work our best native iron-clads, not merely standard-high, but upon the limbs. No varieties with a tendency to die in the forks are of any use if we desire a permanent success.

How many main branches shall our trees have? More than two, certainly, for that makes a fork, and experience

inclines me more and more to say not more than three—that is, if you must have your trees of standard height with a bare trunk of four feet and upward, according to their habit of growth.

More and more I am coming to the conviction that in the north the orchard-grower will do better to be his own nurseryman—that is, to grow his own trees from the ground up. He can thus have just such stocks as he wants, and can train and select them from the very start. All through northern New England I have noticed that orchards so grown are the best in every way—in thrift of trees, in selection of varieties and in excellence of fruit.

In the cold north seedling stocks are excluded by the essential condition that not one seedling in a hundred (aside from Siberians, which are short lived) will be hardy and vigorous enough to found a good tree upon. We must, therefore, rely upon root-grafted stocks, and these we will do well to train from the first exclusively by disbudding. A small wound on a nursery tree is comparatively large, and I would avoid it.

With me, so far, Oldenburgh has proved the best variety to set for top-working, which should be done by budding the second season after setting from the nursery, at three years old. But perhaps we shall find an even better stock among the newer importations. Antonorka looks to me promising; Tetofsky has merits as a hastener of tardy bearing varieties. There is still a great deal to be learned in this direction.

Northern Vermont.

T. H. Hoskins.

Celeriac.

THIS vegetable resembles Celery only in the form of its leaf, the edible part being the root, which in full sized specimens is about three inches in diameter. The top, however, if bleached, can be used, but it has not the crispness of Celery and it is stronger in flavor. I plant seeds about the 1st of March in the greenhouse, but they could be set in any sunny window, sowing the seed thickly in a flat, and covering lightly. Paper should be laid over the flat to retain the moisture, and it should only be lifted occasionally to see that the surface of the soil is not drying. The needed water can be supplied without removing the paper, and the plants will usually sprout in two weeks. The paper should then be taken away to prevent the plants from becoming drawn and feeble. They will grow very thickly, and when an inch high should be transplanted into other flats, setting one plant to each two inches square of surface. Here they remain until set in the open ground in the first half of May. I set them in rows two feet apart, with eight inches between the plants. This is not too thick if the plants are not banked, which is not usually done, as for the production of the root, only the earthing up is not needed.

The Apple-shaped Celeriac (Henderson) is the best variety, being smooth and having a small top, the roots all growing from the bottom, and not all about the bulb, as in most other varieties. With clean culture in rich land (and it should be grown in no other) this variety will grow to an edible size as early as September, and can remain out and continue to grow till the hard frosts of the last of October, when it should be lifted and brought into a light cellar where a temperature can be kept at about forty degrees. I set them on the ground close together, watering at first, and when the roots have taken hold they will grow and keep fresh without further trouble. This is an easy crop to raise, and those who fail with the blanching Celeries often succeed with this. The root is not injured by blanching the top after, or even before the root is grown, and this makes both top and root available.

To prepare it for the table, a German friend gives this as the most approved method: Pare or scrape lightly, then boil till tender and slice among cold boiled Potatoes, with mayonnaise dressing; this makes a specially nice and delightful salad. Celeriac is also used in soups, stews and dressings.

Its keeping qualities are good—fully equal to those of Celery. Even after the top is gone, as it will go toward spring, the root remains sound and as good as ever. Those who relish Celery will not go amiss in trying this form of it in the next season's garden.

West Springfield, Mass.

W. H. Bull.

Clipping Currant Clusters.

SOME experiments were made here last year with Currants by removing the lower half of the flower clusters with a pair of scissors. It is a well known fact that only a few of the berries of any cluster usually mature and the free end of the stem becomes dead before the fruit is ripe. By the re-

moval of this portion before the flowers upon it have opened, it was hoped that there might be a larger and better fruit produced upon the remaining portion of the cluster.

In the experiment alternate bushes in a row were treated with the scissors, and in passing it may be said that this method of thinning can be done rapidly. When the fruit was ripe, the whole product from an average bush, of the clipped and of the unclipped plants, was picked and spread out upon tables. Judges ignorant of what had been done were then called in to inspect the results. No one failed to notice at once the difference and all pronounced in favor of the fruit that had been treated. The berries were larger and of more nearly uniform size and ripeness.

Two hundred berries were next removed from the uncut clusters and it required thirty-five clusters to furnish this number. They weighed, clean of all stems, 152 grams. The same number furnished by thirty clipped clusters weighed 163 grams. These results show that there were about fifteen per cent. more berries to the cluster upon the cut plants than upon the ordinary ones and that these berries were about seven per cent. heavier. The question of quality was only determined by tasting, but there was no doubt in the minds of the judges that the thinned clusters bore fruit of the finest flavor. Like all other fruit currants sell somewhat upon their appearance, and there is no mistake that from the uniform size and ripeness of the fruit, the absence of dead tips on the stems, the clipped clusters were much more attractive.

Further experiments, and upon a larger scale, should be made; but the indications are that there is a point of practical importance in the clipping of the tips of currant clusters at the blooming time.

Byron D. Halsted,

Rutgers College.

Hakea laurina.—Of the many beautiful flowering shrubs belonging to the order *Proteaceæ* coming to us from Australia, this *Hakea* ranks with the very best. A large bush of it when covered with its axillary, ball-like clusters of brilliantly colored flowers, such as is to be met with in the gardens on the Riviera in October and November, is a picture to be remembered. I saw several bushes of it in flower recently, and a box of the flowers just received from a friend residing at Cannes suggests that you in America may like to know something of this shrub. In English gardens it is rarely if ever seen in flower, our climate not being favorable to its setting bloom, although it grows very freely in an ordinary sunny greenhouse. The same circumstance accounts also for the failure here of many other handsome Australian shrubs, which in sunny climes, such as the Riviera, or probably in your southern states, grow and flower profusely. *Hakea* is a genus of nearly one hundred species, all of them Australian. Except *H. laurina* none have beautiful flowers, although many are worthy of cultivation on account of their leaves. In Mr. Hanbury's garden at Mentone I saw recently a bush of this species ten feet high, well furnished with branches. The leaves are alternate, six inches in length, oblanceolate, with prominent parallel nerves and glaucous green in color. The axillary clusters of flowers were very numerous and from their form they are called "crimson sea-urchins." Each cluster is globose, three inches in diameter, and is composed of a great number of tubular flowers arranged closely together, the styles projecting considerably beyond and suggesting the spires of the sea-urchin. The color of the mass of flowers is a glowing crimson, that of the spire-like styles white. It is difficult to convey any idea of the beauty of such a shrub when seen in full flower, but any one who can grow and flower such plants as *Embothrium coccineum*, the *Telopeas* and *Proteas* should secure plants of this *Hakea*. It is also grown under the name of *H. eucalyptoides*.

Senecio macroglossus.—A *Senecio*, with the leaves and climbing habit of common Ivy, and bearing all through the winter numerous elegant flowers as large as Paris Daisies, and colored bright canary-yellow, ought to be a popular garden-plant. But, for some reason or other, it is not. In the succulent house at Kew there are now two fine specimens of this plant, their branches hanging in profusion from the rafters of the roof, and their flowers both abundant and pretty. I have had a few of these flowers standing in water in a room for more than a week, and they are still fresh. There are several climbing species of *Senecio* known in gardens, the commonest, in Continental gardens at least, being *S. mikanioides*, known as German Ivy. The flowers of this plant are, however, no more ornamental than those of Groundsel. *S. macroglossus* was introduced from south Africa to Kew, where it flowered for the first time in 1875. Its leaves so closely resemble those of Ivy that it narrowly escaped being thrown

away after it had been at Kew a year or so, but had not then flowered. The possibility of its proving to be a species of *Hedera*, from Africa, was the means of saving it. Planted in an ordinary border in a greenhouse where it receives plenty of light and air, it soon covers a large space. The branches should be allowed to hang loosely down, so that when in flower the beauty of the plant is properly seen. It goes under the vernacular name of Cape Ivy. H.

Kew.

Water Lilies.—A tank for these aquatics should have a depth of four feet, with a length and width according to convenience, and it may be built in any part of the greenhouse where room can best be spared. Cement is one of the most durable materials for this purpose and at the same time it has a neat

Nymphaea corulea, *N. Devonensis*, *N. alba candidissima*, *N. Zanzibarensis*. *Nelumbium speciosum* is also a handsome aquatic in a heated tank. A good display may be made out-of-doors in summer in a cool tank with the following plants: *Nymphaea odorata*, *Aponogeton distachyon*, *Lymncharis Humboldtii* and *Pontederia crassipes*. These, with the exception of the last, may be planted in tubs or baskets and placed in the tank; the *Pontederia* does not require any soil about the roots, as it floats on the surface of the water. G. B.

South Natick, Mass.

Calanthe Veitchii is a very beautiful species. It is a cross between *Limnates rosea* and *Calanthe vestita*; it is a deciduous plant. The flower spikes vary from two to three



Fig. 4.—Denuded roots of the Bald Cypress, showing knees and underground structure.—See page 21.

appearance. The walls should be eight inches thick, with holes in the bottom large enough to draw off the water when required, and these may be stopped with wooden plugs which should be long enough to stand above the soil. A four-inch pipe around the tank will easily raise the water to a temperature of eighty degrees, the warmth which is necessary, but if the tank is more than twelve feet in width it would be advisable to put in an extra pipe. Good loam to the depth of one foot should be placed in the bottom with a little manure added. To insure an early supply of flowers the bulbs should be planted early in February, putting in enough tepid water to cover the soil and increasing the quantity of water as the plants grow. An essential point in the cultivation of Water Lilies is pure water—*i. e.*, water which has not become stagnant—and this can be secured by inserting a small overflow pipe through the wall of the tank near the top and running in fresh water once or twice a week. The following are a few of the varieties which can be used to make a good display:

feet long, and average from fifteen to thirty flowers on a spike. The flowers are of a rich rose color, with a blotch of white at the base of labellum. *Calanthes* are terrestrial Orchids, and are best grown in pots. The soil we generally use is a mixture of loam, leaf-mold and well decayed cow dung, with a little charcoal and potsherds broken to the size of peas and well mixed in with the soil. These serve to keep the soil porous and fresh. The pots should be well drained and a little moss put over the drainage to keep it open and free from soil. The best time for repotting is just as the plants show signs of making growth. Once in vigorous growth, a little weak liquid manure should be given twice or three times a week. Care must be exercised in using fertilizers in any form, or the foliage may become spotted and disfigured.

This *Calanthe* can be grown in an East India house. It likes abundant light when growing and a fair quantity of sun after the bulbs are formed. This will bring the bulbs to maturity and secure large spikes and perfect flowers.

C. vestita is also a deciduous species of great beauty, and, like *C. Veitchii*, is exceedingly valuable for cutting. It has large, squarish, silvery gray pseudo-bulbs and broadly lanceolate nervose leaves, with tall, gracefully arched scapes of creamy white flowers, with a rich colored spot on the base of the lip. There are often twenty-four and more of these beautiful flowers on a spike. These plants occupy a very small space, and every lover of Orchids should have a few of each kind. There is generally a fine display in our show-house at this season with these flowers, and some Maiden-hair Ferns intermixed with them.

Staatsburgh-on-Hudson, N.Y.

F. Atkins.

Correspondence.

The Knees of the Bald Cypress; A New Theory of Their Function.

To the Editor of GARDEN AND FOREST:

Sir.—From time to time, during and since my first visit to our southern tier of states in 1876, I have examined, sketched and photographed the roots of the Deciduous Cypress—the *Taxodium distichum* of Richard. I was attracted to the tree because of the singular beauty of its form and foliage and by the unusual boldness with which it raises its great, gray, smooth column, sometimes over a hundred feet, perpendicularly, above and upon what an engineer would pronounce a most dangerous foundation—loose submerged sand, the saturated morass or the soft alluvium of low river margins.* But notwithstanding this seeming insecurity, I have never found a healthy Cypress that had fallen before the fierce hurricanes that sweep through the southern forest-lands.†

The surprising and characteristic temerity of the tree is accompanied by another striking peculiarity—it almost invariably, in soft soils, throws upward from the upper surface of its roots conspicuous protuberances that are known as "Cypress knees."‡

These seemingly abnormal growths have attracted much attention, and for more than half a century have furnished an enigma to the solution of which scientific travelers have addressed themselves. Michaux made a careful study of the Cypresses, and in his "Sylva," published in 1819, says: "The roots are charged with protuberances eighteen to twenty-four inches high.‡ These protuberances are always hollow, and smooth on the surface, and are covered with a reddish bark, like the roots, which they resemble in softness of wood. They exhibit no sign of vegetation, and I have never succeeded in obtaining shoots by wounding the surface and covering it with earth. They are peculiar to the Cypress, and begin to appear when it is twenty to twenty-five feet high." Michaux adds, with the frankness natural to a scientific mind, "No cause can be assigned for their existence." Hoopes says in his "Book of Evergreens" (1868): "No apparent function for which the knees are adapted has been ascertained." And Veitch, who seems to have studied the protuberances in England, gives in his "Manual" (1881, p. 216) a picture of a tree growing at Ilesworth, surrounded by scores of knees, and says: "They are peculiar to this Cypress and no cause has been assigned for their existence." That the question continued in this unilluminated condition until recently, was shown in 1882, when I had the privilege of visiting, in company with the highest botanical authorities, Dr. Gray, Thomas

* It is a pleasure to follow Bartram in his enthusiastic burst of admiration for this tree as he writes of it in east Florida 116 years ago: "This Cypress is in the first order of North American trees. Its majestic stature is surprising. On approaching it we are struck with a kind of awe at beholding the stateliness of its trunk, lifting its cumbrous top toward the skies and casting a wide shade on the ground as a dark intervening cloud, which from time to time excludes the rays of the sun. The delicacy of its color and the texture of its leaves exceed everything in vegetation. . . . Prodigious buttresses branch from the trunk on every side, each of which terminates underground in a very large, strong, serpentine root, which strikes off and branches every way just under the surface of the earth, and from these roots grow woody cones, called Cypress knees, four, five and six feet high and from six to eighteen inches and two feet in diameter at the base.

† Elliot ("Bot. of S. C. and Ga.," 1824, p. 643) says: "This Cypress resists the violence of our autumnal gales better than any other of our forest trees." By my friend, Dr. J. S. Newberry, whose extended geological labors have led him to examine many widely separated Cypress-bearing regions in the Mississippi Valley and elsewhere, I am assured that he remembers no instance of the overthrow by the wind of a living *T. distichum*.

‡ Professor Wilson, who has made a careful and valuable study of the species in the forests of southern Florida, and also by cultivation, writes, regarding the formation of these protuberances, "The small roots, which are six or eight inches below the surface, grow upward." . . . "and, upon reaching the surface, turn and go down into the soil." . . . "at each point where the root comes to the surface, begins later the development, on its upper side, of the so-called 'knees'."—*Proc. Acad. Nat. Sci., Philadelphia*, April, 1889. In the organ of the Pennsylvania Forest Association, *Forest Leaves* (December, 1889), is an excellent article by Professor Wilson on the *T. distichum* and a remarkably fine engraving of a tree with enormous knees.

§ I have ridden among them in central Florida in temporarily dry upland basins, where they arose to my breast as I sat upon the saddle, and were not less than seven feet in height above the root.

Meehan, John H. Redfield, John Ball, Professor Carruthers and others, the classic collection of trees planted by William Bartram on the borders of the Schuylkill. There we examined a fine Cypress and the knees it had produced. Dr. Gray then told me that the use to the tree of the knees was unknown. I remarked that they might be a means of raising a point on the root above surrounding water to the end that a leaf-bearing shoot could readily sprout therefrom. To this suggestion he made the same statement made by Michaux and above recorded. Unaware that the subject had been so thoroughly investigated, I have since that period examined hundreds of living "knees" in southern swamps, and found upon them no trace of bud, leaf or sprout, except where some seed may have lodged in a decayed or depressed portion of the surface and there taken root.

In 1887 I had the good fortune to find a number of Cypress-trees under such unusual conditions that their aforesaid subterranean anatomy could be studied without obstruction, and I reached a conclusion respecting the use to the tree of the protuberances, which I have retained in my note-book, awaiting an opportunity to make some further illustrative sketches before placing it before botanists. Some recent publications on the subject, by widely and favorably known authors, have, however, ascribed to the Cypress-knees the sole function of aerating the sap of the parent tree, and this idea bids fair to become embedded in botanical literature. Therefore this communication comes to you earlier than I had purposed sending it.

Stretches of the shore of Lake Monroe, in central Florida, are closely set with large Cypress-trees. They grow in various kinds of bottom—clay, mud and sand. Those of which I shall here speak stood in sand so loose that when the level of the water was lowered the waves readily washed it away and carried it into the depths of the lake. Some four vertical feet of the root-system was thus finely exposed. After several days spent in examining a score or more large trees that had been thus denuded I became convinced that the most important function of the Cypress knee is to stiffen and strengthen the root, in order that a great tree may anchor itself safely in a yielding material.

The word "anchor" is indeed an apt one here, for the living root, curved to its work and firmly grasping the sandy bottom, suggests vividly the best bower-anchor that a man-of-war may throw into similar loose sands, when threatened by the very atmospheric forces that the *Taxodium* has been fitting itself to resist since Tertiary times.*

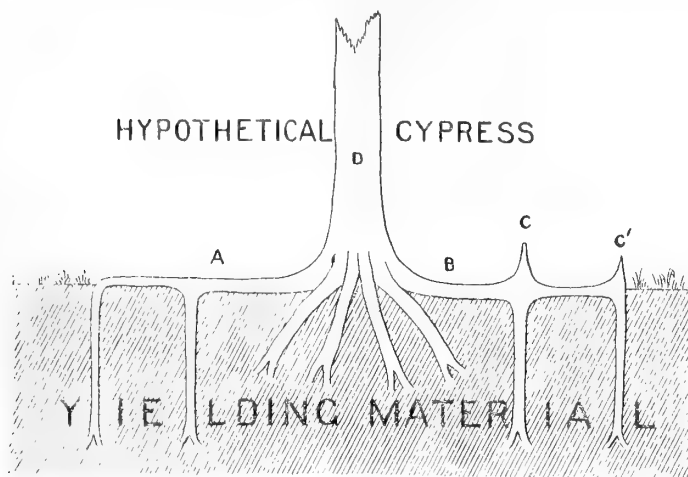
Truly a most admirable and economical arrangement to stiffen and strengthen the connection between the shank of the anchor and its fluke is this knee, and usually in the living anchor the fluke branches or broadens as it descends, so that its effectiveness is greatly increased, like the sailor's anchor of many flukes, or the "mushroom anchor" that he may have learned to depend upon where the bottom is softest.

The accompanying picture (see p. 20) is from a photograph that I made in 1887 of the lower portion of a tree that rises some seventy feet above the shore line of Lake Monroe. The original surface of the sand was near the level of the higher roots. The picture shows the manner in which this peculiar species throws out horizontal roots from its conical (usually hollow) buttressed base. At different distances from this conical base these horizontal roots project strong branches more or less perpendicularly into the earth. Where such perpendicular "flukes" branch from the main horizontal "shank," it will be seen, there is formed a large knob, which is the "knee" under discussion. This knee, when fully developed, is generally hollow,‡ comparatively soft, gnarled, and very difficult to rupture, so that it has the quality of a spring that becomes more rigid as it is extended or compressed out of its normal shape. When in a hurricane the great tree rocks back and forth on its base, and with its immense leverage pulls upon this odd shaped wooden anchor, instead of straightening out in the soft material, as an ordinary root might; thus allowing the tree to lean over and add its weight to the destructive force of the storm, it grips the sand as the bower-anchor would do, and resists every motion. The elasticity at the point of junction allows one after another of the perpendicular flukes attached to the same shank to come into effective action, so that before

* Professor Shaler, in a most interesting treatise on the nature and associations of *T. distichum*, shows that the Cypress which existed in the Miocene age has since then probably gradually changed its habitat from the drier ground to the swamp areas. See *Mem. Mus. Comp. Zoology, Harvard Univ.*, Vol. XVI., No. 1.

† My friend Thomas Meehan informs me (December 17th, 1889) that he has "observed a case where the interior hollow makes an annual layer of bark equally with the exterior" and he is of the opinion that "it is by the decay of the outer layer of this inside course of bark after several years that the knob becomes hollow." If this habit is general it is an admirable means of forming and of preserving undecayed, at the smallest cost to the tree, a living elastic strengthener at the forking of the roots.

being drawn from the sand or ruptured the combined flukes present an enormous resistance.



The above drawing I have made for the purpose of simplifying the discussion. It shows a hypothetical Cypress with two roots of the same length and diameter—one with knees, the other without them. The superior strength of the stiffened root would seem sufficiently evident; but, with the view of obtaining the judgment of a mind thoroughly trained in questions of this nature, I submitted the drawing to my friend, Charles Macdonald, late Director of the American Society of Civil Engineers, whose eye has been accustomed to estimating the value of strains in structures by an active experience of twenty-five years, and who has just finished the largest drawbridge in America, at New London. Mr. Macdonald agreed with me that the root B, which is trussed with the knees C and C', would very largely exceed in capacity for holding the tree firmly in yielding material the root A, which is similar but destitute of knees. This greatly increased security against destruction by storms is, I think, a sufficient advantage to account for the existence and maintenance of an organ that draws so slightly upon the vitality of the plant.

It is proper to record here another observation that may explain the existence of the elevated, narrow point which the knee sometimes develops and which rises higher than the curved growth that would be necessary to secure the maximum resistance to compression and extension. The home of the Cypress is in broad, level river-margins subject to periodic overflow, where hundreds of square miles become covered with a shallow bed of slowly moving water, or in basin-like depressions, sometimes of vast extent, where from time to time water rises above the level of the horizontal roots. Then these stake-like protuberances, rising into and through the current formed by the drainage or by the winds, catch and hold around the roots of the parent trees many thousand pounds of "plant food" in the form of reeds and grass, or small twigs among which dead leaves become entangled. The tree that exclusively possesses this source of nutrition is at an advantage over all others in the neighborhood, and the higher these attenuated "drift-catchers" rise in the stream, the more drift will they arrest, for the highest stratum of water is richest in float. The theory that some distinguished writers have suggested that the knee is a factor in the aëration of the sap and that the tree's death is prevented by such aëration taking place in the upper portion of the knee during periods of high water, would seem to need careful experimental confirmation. Where nature forms an organ whose purpose is to preserve the life of the individual, she takes special care to adapt such organ to the function it is depended upon to perform. In this case the rough, dry bark of the knee offers a most imperfect means of access for the oxygen or other gases of the atmosphere to the interior vessels of the plant, and instead of presenting broad surfaces of permeable membrane, formed for transmitting elastic fluids, at its upper extremity the protuberance becomes more narrow and presents less surface as it rises, so that when during periods of high water the life of the tree is most jeopardized, the life-saving organ attains its minimum capacity. In the presence of this manifest want of adaptation it also seems important for the acceptance of the aërating theory that some one should experimentally show that the aërating organ of the Cypress really aërates

to an extent sufficient to make it of material advantage to the plant.*

It was long ago observed that no knees are developed when the tree grows in upland upon a firm bottom, in which ordinary simple roots can obtain in the ordinary way the hold necessary to resist overturning forces, and where there is no stratum of water to transport food. So conservative is nature, that she reverts to an original or adopts a simpler form of root even in a single generation if the need for the more complicated arrangement ceases to exist.

Finally, I may perhaps be permitted to add an observation regarding the roots of other trees that trench upon the same soils affected by the Cypress and often take advantage of the anchors it sets so boldly in treacherous bottoms. These trees project their cable-like, flexible roots in every direction horizontally, interlacing continually until a fabric is woven on the surface of the soft earth like the tangled web of a gigantic basket. Out of this close wicker-work, firmly attached to it, and dependent for their support upon its integrity, rise the tree trunks. Thus slowly, and by a community of growth and action, a structure is formed that supplies for each tree a means of resisting the storms. Such communities of trees, provided with ordinary roots, advance against and overcome enemies where singly they would perish in the conflict. The cyclone, the loose sand, the morass—these are the enemies they contend with, as it were, in unbroken phalanx, shoulder to shoulder, their shields locked, their spears bristling against the foe; but the graceful plumed Cypress, the knight-errant of the sylvan host, bearing with him his trusty anchor—the emblem of Hope—goes forth alone and defiant, afar from his fellows, scorning the methods of his vassals, and planting himself boldly amid a waste of waters, where no other tree dare venture, stands, age after age, erect, isolated, but ever ready to do battle with the elements. Twenty centuries of driving rain and snow and fierce hurricane beat upon his towering form, and yet he stands there, the stern, gray and solitary sentinel of the morass, clinging to the quaking earth with the grasp of Hercules, to whom men were building temples when his wardenship began.

New York, Jan. 2d.

Robert H. Lamborn.

A Chart of Standard Colors.

To the Editor of GARDEN AND FOREST:

Sir.—Having read Mr. Orcutt's plea (vol. ii., p. 622) for a "complete nomenclature of colors for field use," permit me to give a few of the reasons why such a work is probably impracticable—reasons which have been made clear to me through practical experience, including the publication of a work intended to supply this well-known want and subsequent experiments on a very extensive scale. A work that would "show every color in nature" would, of course, include a much greater number of hues than are given in my "Nomenclature of Colors" (186), and consequently must be more expensive; yet apparently the chief objection to my book is that it is expensive—the cost is \$4.00. In fact, the expense of publishing such a work lies almost wholly in reproducing the colors, the question of accompanying text being, relatively, hardly worth considering. Mr. Orcutt is mistaken, however, when he says that in my book "only those shades which occur in our native birds are shown," for possibly half of the 186 colors cannot be found in any North American bird, while probably there are extremely few seen in flowers which are not to be found among them.

There are only two known methods by which colors can be represented in book or chart form—by chromo-lithography and by hand-painting. The former is wholly inadequate for the reason that it is limited to a comparatively small number of hues, from which must be omitted nearly all the pure colors and delicate tints. The second, while more expensive, is adequate and practicable, the principal difficulty being to secure absolute uniformity in different copies and editions, and this is a prime requisite, since any variation in this respect would render such a work worse than useless.

I have before me at this moment, as the result of my experiments, a collection of 411 more or less different colors,

*The "Chemical Theory" of the Cypress knee seems to be but a revival of the elaborate hypothesis of Dickinson and Brown, published in their memoir on *T. distichum* in the *American Journal of Science and Arts*, in January, 1848. These industrious observers discard the "Mechanical Theory" entirely, and consider both the spongy knees and, strangely enough, even the spreading base of the tree, as organs of communication with the air, forgetful that the successful and most celebrated lighthouse in the world—the Eddystone—was avowedly modeled after a similar spreading tree-base for the purpose of withstanding the storm shocks of the English Channel. By means of a curious drawing they show how the swollen portions of the base rise "to the top of the highest water level, which must, in some instances, attain an elevation of at least twenty-five feet;" thus continuing the functions and the structure of the knees, "up the body of the tree to the atmosphere."

hues and tints,* no less than 329 of which are made from five pigments. These include all variations of color that it is possible to represent pictorially, and I have devised a method by which absolute uniformity in different copies of each can be guaranteed. The collection is accompanied by clear and simple formulæ for reproducing each, and I can safely say that every objection which has been found to my first attempt in this line (the before-mentioned "Nomenclature of Colors"), except that of cost, has been completely overcome. But this simple question of cost of publication is the problem which I have been unable to solve, and if Mr. Orcutt or any one else can explain how it can be solved, the great desideratum of a complete, simple and wholly satisfactory nomenclature of colors for naturalists of every class can easily be supplied.

Washington, D. C.

Robert Ridgway.

Magnolia glauca in Massachusetts.

To the Editor of GARDEN AND FOREST:

Sir.—In regard to the Massachusetts Station of *Magnolia glauca*, noticed in GARDEN AND FOREST (ii. 612), the following may be of interest to some of your readers:

"The first specimen of the *Magnolia glauca* noticed in Massachusetts was brought from Cape Ann Woods in the summer of 1805, by the late Chief Justice Parsons. He observed a number of the plants in flower as he was journeying on that road, and being struck with their beautiful appearance, gathered a few, which he brought to Boston for examination by his friends. I happened to be at his house on the day he returned from his journey. He showed me his acquisition, and wished to know what it was. I took one of the specimens home for examination, and found it to be *Magnolia glauca*—a most unexpected inhabitant of our region. J. D."

The above is a marginal note, written by Judge John Davis, of Boston, in his copy of the first edition of Bigelow's "Florula Bostoniensis" (a presentation copy to "Judge Davis, from his friend and serv't, the Author") on the page where the *Magnolia* is described.

Needham, Mass.

T. O. Fuller.

The Mild Winter.

To the Editor of GARDEN AND FOREST:

Sir.—On December 28th, 1889, I found *Draba verna* (Whitlow-Grass) in flower and fruit. I have never found this plant in flower in this locality earlier than in the last week in March. On December 30th, I found *Arenaria squarrosa* (Pine Barren Sandwort) in blossom in two places. This plant usually flowers in the first week in June, and though I have often found a few scattering flowers in the late fall, I have never before found it in flower later than the first week in November. I also found on December 30th *Leptophyllum buxifolium* (Sand Myrtle) in bloom. This plant flowers the first or second week in May, and, though it is like *A. squarrosa*, usually a fall bloomer, I have only found it once before in bloom in December.

On January 2d our early spring flowers, *Pyxidanthra barbata*, *Epigæa repens* and *Cassandra calyculata*, showed their buds unusually swollen, but I could find no expanded flowers; but on the same day *Scleranthus annuus* and *Lamium amplexicaule* were in full bloom.

I may add that many grasshoppers are found in the fields, and that, occasionally, moths are seen in the woods. The frogs are croaking vigorously to-day.

John E. Peters.

Pleasantville, N. J., January 2d, 1890.

To the Editor of GARDEN AND FOREST:

Sir.—So mild was the late December that the growth of the various Grasses and White Clover was not checked. On the 31st I gathered *Viola cucullata*, *Taraxacum Dens-leonis*, *Stellaria media* and *Viola rotundifolia*, not scatteringly, but in April-like abundance. A Red Maple (*Acer rubrum*) in the rear of my office is now well covered with blossoms, and has been since the 27th of December. The earliest record of blooming previously is February 7th, 1887. Rose-bushes are putting out a profusion of new leaves. The Japanese Quince is in bloom. Tulips, Hyacinths, Columbines and all the March and April bloomers are up. With growth so started and sap flowing so freely, the results that must surely come with the sudden changes of January and February are not pleasant to think of.

Lawrenceburgh, Ind.

S. H. Collins.

*These may be roughly classified as follows: Grays, 46; browns (including olives), 108; red-browns, brown-reds, etc., 39; yellow-browns, brown-yellows, etc., 31; reds (including pinks), 35; purples, 41; blues, 32; greens, 40; yellows (including oranges), 39.

Periodical Literature.

The *Popular Science Monthly* for January contains an unusual number of articles interesting to students of plant life. One, called "A Harvest from the Ocean," is a description by Professor C. Morton Strahan of Sea-weed gathering on the north-western shores of Europe, and of the uses to which the dried plants are put. Another is a translation from *La Nature* of an essay by Monsieur J. Poisson on "Palm-trees and their Uses." It will, perhaps, surprise the general reader to know that more than a thousand species of Palms, belonging to about one hundred and thirty genera, have now been determined, as against eight or ten species, belonging to half a dozen genera, which were known in the time of Linnæus. The list of uses to which the various parts of very many of these species are put is practically endless, but its extent is at least indicated in M. Poisson's pages. The Date Palm and the Coconut Palm are of course those whose fruit is most widely serviceable to man; but a large number of others furnish food which, either raw or cooked, is useful to savage or semi-civilized tribes. From bridges to dish cloths, from houses to ornaments for the person, there seems to be nothing which, in some part of the world, is not manufactured out of some species of Palm. But the substance least commonly recognized as wrought from a member of the Palm family is doubtless that which we call rattan. It is often supposed to be derived from some sort of cane or bamboo, but is in reality the stem of a climbing Palm or Palm-vine, of which the jungles of the East Indian Archipelago are largely composed, and which sometimes reaches a length of a hundred yards before its continuity is lost to sight in the overarching network of the forest. A striking picture of an avenue of Cabbage Palms in the "Savannah" of Cayenne accompanies this article. Another, likewise translated from *La Nature*, is a superficial chapter on Orchids, which was hardly worth reprinting. And a fourth is a brief but significant word on "The Irrigation of Arid Lands," by Mr. Henry J. Philpott. "There is no more striking difference between the inhabitants of the eastern and western United States," says the author, "than the degree of their familiarity with the word irrigation. And there will never be a profounder difference than will be engendered by the thing itself." Here at the east we irrigate the flower-garden, the lawn, and the vegetable-garden when its contents are first transplanted. "But the idea of watering a whole farm—not a New England 'patch,' but a western ranch of from fifty to fifty thousand acres—seems a financial absurdity. What the eastern farmer could not produce without such expensive cultivation he would say was not worth producing. Equally incredible will seem farming without irrigation to the generation now growing to manhood over a large part of the Pacific Coast. To them it will seem an absurdity not to have the water as fully under your own control as the land. They would not want to cultivate land if they had to take the chances on there being neither too much nor too little rain." Mr. Philpott describes the various methods of irrigation now employed in the west, some of them primitively simple, but others very elaborate, and so costly that the stranger cannot conceive how it pays to employ them merely for pasturage grounds and the raising of hay. In certain soils irrigation continued for some years suffices. The ground becomes saturated and "its former supply may be carried on to reclaim new deserts. . . . Thousands of acres in the San Joaquin Valley have been placed beyond the need of further irrigation. The whole valley was once a desert." Sometimes, indeed, land has been injured by over-watering. "Alkali has been brought on or brought up, the soil has been made heavy, pools have been formed from the 'seepage,' and orchards and vineyards have been spoiled." But how great are the benefits of proper irrigation may be read in the fact that Mr. Philpott speaks of an auction sale of plots belonging to a land and irrigation company where land "which ten years ago was an uninhabitable desert, was knocked down at fifty, a hundred, and even a hundred and fifty dollars an acre. The water rate is extra and is so much per inch used. An inch is the amount that will run through an orifice an inch square in the course of a year." Not the least interesting part of this paper is its reference to the new legal questions which have arisen in a country where the right to the water supply is as important as the title to the land itself, and to the complications which such a state of things has produced in the government's dealings with purchasers. As to the future conduct of the Land Office with regard to water-rights and to the schemes of speculators, Mr. Philpott significantly says, "This is a matter of several hundred times more importance than one eastern man in a dozen will dream of."

Notes.

Twenty tons of Violets are annually used in Cannes and Nice for the making of perfumes and 120 tons of Orange-blossoms.

It is said that as many as one hundred and fifty varieties of preserves are made in Roumania, many of which are flavored with the petals of flowers.

The twenty-third annual meeting of the Minnesota State Horticultural Society will begin at Excelsior, a suburb of Minneapolis, on Lake Minnetonka, on January 21st, and continue four days.

An interesting object exhibited at Christmas-time in the window of a Broadway florist was a piece of a branch of a tree about a yard long and two inches in diameter, from which grew at regular intervals four luxuriant bunches of Mistletoe.

A correspondent writes that it may be true that the use of so many Balsams and Spruces will not endanger the timber supply of Maine, but he adds that he cannot suppress a feeling of regret when he observes among Christmas decorations huge specimens of *Rhododendron maximum*, and entire trees of the American Holly, *Ilex opaca*.

We have received many letters, for which we have no further space, from correspondents who give lists of flowers blooming out of their season. But with Bluets (*Houstonia carulea*) flowering by New England roadsides, *Anemone blanda* opening in the suburban gardens of this city and Dandelions starring the turf everywhere on the day after New Year's, it is safe to pronounce this an exceptional winter.

Croton Alabamensis (see GARDEN AND FOREST, ii., 592, f. 150) is now in flower in the propagating house at the Arnold Arboretum. The bright golden anthers of the male flowers make the inflorescence conspicuous and attractive. The great beauty of this plant consists, however, in the contrast between the brilliant green of the upper surface of the leaves and the snowy white coloring of their under surface and of the young branches.

We have received for examination from Messrs. Johnson & Stokes, of Philadelphia, a label for plants and trees which seems to be a novelty of some promise. It is made of copper, which is durable; it readily receives and firmly retains any inscription, and its tags are so flexible that, with proper adjustment, they need not injure the plant to which they are attached as wire does. We should be gratified to have those of our readers who may be testing this label report the results of their experience.

The increased demand of late years for green for Christmas decoration has caused the introduction of branches of a number of plants into the markets of the northern cities for this purpose. Last week we mentioned finely fruited specimens of the Japanese evergreen Spindle-tree (*Euonymus Japonica*). The supply came from Georgia, and the lustrous foliage makes a handsome contrast with the brilliant scarlet arils of the fruit. The Cassena, too (*Ilex vomitoria*), with its small, shining, evergreen leaves, and clusters of small, bright red fruit, is sold at the north now in large quantities, and is admirably adapted for the purposes of Christmas decoration.

In a late bulletin published by the Ohio Experiment Station, Mr. C. M. Weed gives a partial bibliography and systematic list of the insects which are known to attack Clover. The list includes more than eighty species, and there is little doubt that it will be greatly extended within the next few years, as our knowledge increases. Every part of the plant has its special enemy, from the smallest rootlet to the stem, leaves, blossoms and seed. The ravages of these insects are so serious, especially the destruction wrought by the Midge and the Root Borer, that much apprehension is felt for the future of the Clover-crop, one of the most important of our agricultural products.

Dr. Charles Mohr, of Mobile, sends us specimens of the Nutmeg Hickory (*Hicoria myristicaeforis*) from the banks of the Alabama River, near Hazen, Alabama. This is a new and interesting station for this tree, which formerly was supposed to be confined to the single restricted locality near the coast of South Carolina, which remained, until this Alabama station was discovered, the only place east of the Mississippi River where it was known to grow. Many years after its discovery in Southern California the Nutmeg Hickory was found to be a

common tree in southern Arkansas, and last year it was discovered most unexpectedly in the mountains of north-eastern Mexico by Mr. C. G. Pringle.

A correspondent of the *American Agriculturist* points out some ways in which the grafting of annuals and other herbaceous plants can be made available for special purposes. Cucumbers, for example, may be grown on a high trellis, or around the upper story windows of any building, by training either *Sicyos angulatus* (the Single-seeded Star Cucumber vine), or the *Echinocystis* (Wild Balsam-apple)—either of which will grow to the desired height. Cucumber seed may then be sown in a flower pot, and when the plant is six or eight inches high it may be joined to one of these wild vines at the desired height. Merely scraping the bark of the two plants and tying them firmly together with any soft material is sufficient. They will unite in about ten or twelve days, or sooner, and produce fruits at a height to which the Garden Cucumber could never attain.

One of the largest specimens of Black Walnut probably ever sent to an eastern market in the log may now be seen in the timber yard of Messrs. Johnson Bros., 385 Albany Street, Boston. The tree which produced it grew near the falls of the Kenawah, in West Virginia, on the line of the Chesapeake & Ohio Railroad. The trunk, which measured sixty-four feet to the first branches, has been cut into five lengths; the butt log, the centre of which is hollow from decay, measures at the base eight feet and a half across. The diameter of the log, cut twenty-five feet from the ground, is four feet two inches, and that fifty feet from the ground has a diameter of three feet eleven inches in one direction and three feet in the other. The upper end of the fifth log, at a point sixty-one feet from the ground, where the trunk had been a good deal flattened, measures four feet one inch through one diameter, and two feet nine inches through the other. These measurements are all made inside the bark. A thousand feet of lumber have been cut from the main branches and the five trunk logs are estimated to contain 10,000 feet. The wood in the butt log outside the central cavity is beautifully curled and marked. A superficial examination of the annual layers of growth shows that this great tree has grown on the whole with wonderful rapidity and that it is probably less than 300 years old.

Dr. Hadjime Watanabe, an official of the Japanese Agricultural Service, delivered an interesting address on the Chrysanthemum at the recent celebration in Berlin of the centennial of the plant's introduction into European cultivation. According to the report of his words, published in *Gartenflora*, the Japanese divide Chrysanthemums into two groups—"Nogiku" or wild single, and "Niwigiku" or double cultivated flowers; and the latter are subdivided into four kinds—the ordinary autumn-blooming sorts, the summer-blooming, the winter-blooming, and those which bear flowers at all four seasons. The single flower is not neglected by the horticulturist, but is prized for its very simplicity, and is usually planted at the foot of rocks, intermingled with Grasses, to give a landscape design a naturalistic air. In treating the double-flowered plant when it is desired to produce individual flowers of the largest possible size, then all the branches but one are gradually removed, and on this one only an isolated blossom is allowed to mature. On the other hand, when as many flowers as possible are sought without regard to conspicuous size, the main stem is brought to the greatest possible development, and all its branches are preserved until the blooming season arrives, when, if some show no buds, they are cut away. The sturdiest possible plants are chosen for this purpose and the speaker referred to some upon which more than three hundred flowers had been counted. Two forms are in favor for these many-flowered Kikus, one of which gets its name from its resemblance to a thick broom, while the other is a more artificial, fan-like shape. A Japanese proverb says "it is easy to grow the flowers of the Kiku, but difficult to grow its leaves," and the speaker declared that the plants are judged from this standpoint. The amateur's Chrysanthemums are usually "very poor and faulty in foliage, although they may bear fine flowers; but those which one sees at an 'art-gardener's' are clothed from top to bottom with leaves regularly disposed and of a beautiful fresh color." The most common method of propagating the plant is by root-division, but several others are employed. In one, a single leaf with a bud at its base is plucked, lightly covered with earth and laid in a shady place, where it eventually takes root. Gardeners who own rare varieties therefore forbid the visitor a near approach to their plants, as it would be easy to pick a leaf of the proper kind and conceal it in the pocket for future planting.

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The Forests of California.

THE memorial to the congress of the United States which has recently been drawn up by the California State Board of Forestry is most interesting as an official statement of the question which more profoundly affects the material welfare of that state than any other; it is important also because it sets forth with singular clearness of statement the peculiar dangers which beset the mountain forests of that region and the sweeping disasters which must inevitably follow their destruction. The progress and development of many portions of the Pacific states depends almost entirely upon their water supply; so much so that a failure of this supply would paralyze all industry and involve the entire section in bankruptcy. Mining, as at present conducted, can only be carried on where water abounds, and many rich mineral regions along that coast are now unproductive during a large portion of the year on account of an inadequate water supply. It is believed that this inadequate supply is partly owing to the diminution in the volume of many of the streams which head along the slopes and on the crests of the Sierra Nevada Mountains and its spurs and that this diminution is directly traceable to the wanton deforestation of these slopes. Many of these mountain lands have passed into private and corporate hands, and this fact multiplies the difficulties of imposing effectual restraints upon the destruction of timber by fire, by the axe and by the flocks of sheep which are pasturing the life out of the forests. Nevertheless there remain among the water sheds of the Sierra Nevada millions of acres of land still owned in fee simple by the United States. These lands are covered with forests to protect the fountains of the streams which furnish the very life-blood to the mining interests of the state, to its agriculture and horticulture, and to its inland commerce by preserving the navigable flow of the Sacramento and San Joachin Rivers. The custody of these lands, a part of the nation's inheritance, most certainly demands wise management, and therefore the forest officers of California address the general government with the full assurance that they have a right to ask for these mountain forests as careful stewardship as that given to the moneys in the public treasury.

Measures have been undertaken by the general government to punish marauders for cutting timber on the public domain, and yet it is held that the value and volume of all the timber and fuel that has been stolen in California for twenty years past are a trifle when compared with the standing timber and the growing young forests which are swept away every year by the combined agencies of fire and of sheep. It is not asked that there should be any abatement of energy in the suppression of the minor evil, but it is urged that the government falls short of its duty when it permits, without remonstrance, the obliteration of its forests by mountain fires and the more complete extinction of their young growth by browsing animals, even though it does spend a great deal of money in the prosecution and occasional conviction of some comparatively petty trespasser. Recognizing the water-storing character of forests and the danger from freshets which their removal will cause, this memorial invites attention to the added peril which will come from the encroachment of the inhospitable climate of the torrid and treeless districts lying to the south and south-east of the state if the great forests of the north-west coast which help to resist the enlargement of this arid region shall be swept away.

In view of all these dangers the Board of Forestry suggests, in the first place, the temporary removal of the Timber-entry Law in California and the absolute withdrawal from sale of all Federal timber-lands in that state until future surveys have determined the areas and boundaries of such tracts as are necessary to insure the integrity of the streams and natural waterways of the state. Again, it is recommended that the timber of such lands when fit to harvest shall be sold, and not the land. For this land the lumberman cares little. He buys so many feet of saw logs to the acre, and he will pay as much for the timber alone as he will for the timber and the land it stands on. Hence in selling the timber alone there is no loss of revenue to the Government, and while the fee of the land remains in the United States such regulations can be imposed for the preservation of the young growth and for the prevention of fires, as will insure the perpetual forest character of the land and secure continuous revenue for the future. It is worth noting that this plan has already been adopted with good results in Canada. The owners of sheep and cattle have so long used and abused the forest-land as a free range that they have come to think they have a special right to pillage the public domain that is denied to people engaged in other pursuits. But since the conviction of a few timber thieves has abated the once thriving industry of lumber-stealing, the same vigorous process would greatly mitigate the theft of pasture and the fires that invariably accompany it. It is also suggested that encouragement should be tendered to those who are willing to plant large tracts of forest on the mountain and foot-hill lands, which are unsuitable for agricultural use, and as a means to this end the establishment of forest experiment stations in the arid districts of Colorado, California, Nevada and Arizona is advised.

Every one who has had an opportunity to observe the forests of California and to note the influences which are working to curtail them on every side will endorse the concluding statement of this memorial:

The present administration, or rather want of administration, of the Federal timber-lands of this coast, is an arraignment of the best intelligence and patriotism of the general government, which a disregard of the enlightened methods of other nations might not alone challenge, but which a due regard to ourselves and posterity does, and which strenuously and exigently calls for reformation and remedial measures that shall check the menace to our immediate and future prosperity.

It is to be hoped that Congress will not bury this rational and patriotic appeal in the pigeon-hole of some committee room, but that they will give it the deliberate attention which the far-reaching importance of the subject de-

mands. It is to be hoped, furthermore, that this paper will be read and pondered by friends of our forest throughout the entire country. Copies of the memorial can be obtained from Mr. William S. Lyon, forester of the commission, whose address is Los Angeles, California, and who invites the co-operation of public-spirited citizens in every part of the Union in urging its consideration upon the Congress now in session.

A prospectus relating to the new scholarships offered under the foundation of the Missouri Botanical Garden has been issued. Applications for these scholarships, which will not exceed six in number, must be in the hands of the director, Professor Trelease, not later than the 1st of March. A preliminary examination will be held on the 4th of that month. If there are more than six applicants for the scholarships, a competitive examination will be held on the 7th and 8th. The preliminary examination will be confined to English grammar, reading, writing, spelling, arithmetic and geography. The competitive examination, only held in case there are more applicants than scholarships, will embrace the history of the United States, English literature, algebra, German, elements of botany and zoology, and such other subjects as may be prescribed. Arrangements are made by which candidates living remote from St. Louis, who may desire to save the expense of a journey to that city, can be examined at their homes by the principal of some approved school. Successful candidates will begin work in the garden the 1st of April. They are to be lodged in comfortable rooms in a dwelling adjoining the garden under the charge of the head-gardener or some other competent person. Board can be obtained at reasonable cost.

It is the intention of the trustees of the school to make, as far as possible, the surroundings of the pupils home-like, although they assume no responsibility for their behavior outside of working hours. The scholarships may be held for six years, and the incumbents will be paid fortnightly at the rate of \$200 a year for the first year, \$250 for the second year and \$300 for the remaining years. During the first year of their scholarship, garden pupils will be expected to work at the practical duties of the garden nine or ten hours daily, according to the season, and to read the notes and articles referring to the subject of their work in one or more good journals. In the second year, in addition to five hours' manual work, they will be given instruction and will be expected to do thorough reading in vegetable-gardening, flower-gardening, simple fruit-culture and orchard-culture. During the third year, in addition to their five hours' manual labor, they are to be instructed in forestry, elemental botany, landscape-gardening and the rudiments of surveying and grading, and will be required to take charge of clipping or indexing some department of the current gardening papers. The fourth year they are to study the botany of weeds, garden vegetables and fruits, with simple book-keeping and the legal forms for leases, deeds, etc. The fifth year they are to be instructed in vegetable physiology, economic entomology, fungi, especially those which cause diseases of cultivated plants; and each pupil, in addition to his five hours of manual labor, will keep a simple set of accounts pertaining to one department of the garden. They will study, during the sixth year, the botany of garden-plants, trees in their winter aspects, and the theory of special gardening connected with some branch of the work they are charged with in the garden.

With such opportunities for practice and study, a young man of ordinary intelligence and industry ought to be well equipped at the end of his six years, and able to command agreeable and remunerative labor. The demand for thoroughly instructed men to serve as managers of public parks and private estates is large already in this country, and steadily increasing. Skillful plant-growers abound, but really good gardeners, in the broad sense of the term, are difficult to find in America and in every other country.

The Forest Pavilion at the French Exhibition.

THE exhibition of the forest department of the French government at Paris last summer was perhaps the most comprehensive and best arranged display of its kind that has ever been made. The Forest Pavilion, which appears in our illustration on page 32, and its contents, were, of course, of the highest significance to visitors interested specially in forests and their products, and there was, perhaps, no one spot in the whole exhibition more frequented by the general public, who found, apparently, much to attract and instruct in the beauty of the building itself and in the variety of its contents. Indeed, so great was the crowd of people who thronged the building from morning till night, that anything like a critical examination of its contents was practically out of the question.

The building,* constructed entirely of logs cut in the forests belonging to the French government, representing all the indigenous trees of France and covered with their bark, was 125 feet long and nearly 120 feet wide. It consisted of one main hall, surrounded on three sides by a broad porch or piazza, with a half-story added at the rear and reached by an interior staircase, which admitted also to a wide gallery surrounding the main hall. The general scheme of the arrangement was due to M. de Gayffier, Director-General of the French forests, and was carried out most intelligently by a young architect, M. Lucien Leblanc.

Around the interior of the main hall trunks of the different species were arranged as columns to support the gallery, and between these were placed, first, a large cross-section of a trunk of the species, and then above this artistically grouped samples of all the principal objects made from the wood—an arrangement which enabled the visitor to see at a glance the wood of any given species and the principal products manufactured from it. The centre of the hall was occupied by working models of saw-mills and various machines used in working wood, and a number of specimens showing the methods of cutting up logs to the best advantage. The gallery surrounding the main hall contained a large number of smaller wood specimens, a large collection of microscopic slides illustrating the structure of the French woods, models of fungi injurious to wood, a most instructive series of specimens showing the results of different injuries to wood, abnormal growths, and the like, with an immense number of the minor products of the forest arranged systematically under the different species, tree-fruits, seeds, etc.

The most interesting part of the exhibition, to the general public at least, was found in the half-story. Here, in two or three small rooms, comfortably arranged with tables and seats, were maps and plans of French forests and immense collections of photographs illustrating French forest scenes in all their varied aspects. These rooms contained two plans in relief of the torrents of Vaudaine and of Riouchanal, and of various torrents in the Hautes-Alpes, and a series of water-colors of various torrents both in the Alps and in the Pyrenees. Three dioramas most artistically arranged in the rear of the half-story exhibited, in a remarkable and instructive way, the effects of mountain torrents and the labor required to restrain them within reasonable bounds. The first represented the torrent of Bourget in the Basses-Alpes, which for years devastated the valley of the Ubaye, but which, thanks to the intelligence and energy of the French forest-department, is now conquered. This end was accomplished by building a series of dams and by raising the bed of the stream bodily above its natural level, the flow of the water into the channel being checked by reducing the slopes and covering them with a forest of coniferous trees. The diorama shows the break-waters with the workmen engaged in planting the trees that to-day cover 1,200 acres, bordering an ordinary mountain stream which eighteen years before was one of the dangerous torrents of France. The second diorama shows the torrents of Riou Bourdoux, also in the Basses-Alpes, famous for its devastations and the most dangerous torrent of the French Alps. It once destroyed everything along its course and threatened the extermination of Barcelonnette, near which place it has its mouth. The diorama shows a dam constructed by the forest department, a colossal construction in masonry and hydraulic mortar, twenty-five to thirty feet high and nearly 300 feet long, intended to hold back the solid material brought down by the torrent and to prevent the passage of anything but the water. The work was only commenced in 1875, but a young forest already covers and holds the ground which, before it was planted, was entirely bare and

* A description of the Pavilion, with some account of the forest material which it contained, was given in GARDEN AND FOREST (ii, 478, 490.)

subject to constant movement. The third diorama shows the slope of Péguerre near Cauterets. Here it was not a question of restraining a torrent, but of preventing a mountain from sliding down and destroying, in its fall, the town of Cauterets. The work was accomplished by removing, in the first place, all the loose blocks of stone and then by clothing the loose and rocky soil with a vegetable covering consisting of squares of sod held up by cross walls of dry stone. This work, commenced in 1885, has been successfully terminated and the result is considered a marked success. The dioramas were seen through darkened chambers made to represent, in one case, the hut of a forest guardian with its rude furniture, and in another, a camp for the laborers employed on the work represented in the accompanying diorama, the naturalness of the effect being heightened by the presence of their tools and camp equipage.

Some idea of the care with which the Forest Pavilion and its contents were prepared will appear from the fact that the whole building was set up and arranged in the forest of Fontainebleau and then taken to pieces and removed to Paris. It is to find a permanent resting-place in the Bois de Vincennes at the other end of Paris, where it will serve to instruct and delight visitors to the French capital interested in forests and forestry. Indeed, it would be worth preserving for its beauty alone. Far from having the fragile, trivial look of most "rustic" constructions, its excellence in proportion, outline and execution give it genuine architectural character; and this is enhanced by the charm of its color. The panels of wood that cover the wall spaces between the supports are arranged in attractive patterns formed by the contrasting colors of the barks. The design of the piazzas and the interior gallery is particularly pretty, and much skill was shown in giving architectural dignity to the columns which support this last without the use of other material than that elsewhere adopted. Capitals of many curious yet appropriate shapes were made by groups of twisted roots, and were finished below by a simulation of a "cable moulding" formed of bast rope.

There is one criticism to make on this exhibition, and that is the absence of an official catalogue similar to the one published by the French government in connection with its forest exhibition of 1876. Such a catalogue would have added vastly to the benefit which visitors to the forest exhibition of 1889 derived from it.

Down the Rhone.—II.

JUST below Sarraz, but on the eastern shore, lies St. Vallier, where a stone bridge spans the river with two arches that rest on a huge mid-stream pier. Like many Rhone towns, it is a single long row of closely built houses facing the high esplanade formed by the embankment. There could be no more delightful arrangement for the idle stroller or for that still idler fisherman who so perpetually appears in France. What can be caught in the Rhone I do not know, but its banks were lined with placid anglers from Vienne to Avignon—now perched on a lofty water-wall, now cosily nestled among overhanging Willows by some shady pool. Villages abound on the steep slopes—compact little clusters often set on spots where one wonders how they keep their foothold. Now they are surrounded by fields and vineyards, but again they seem carved out of the naked rock that supports them. They must be cold in winter and hot in summer, with no protection from either storm or sun. But to the artist's eye they are faultless, so entire is the harmony between man's work and Nature's. Built of the local stone, they are so like it in color and texture that they seem to have grown as spontaneously as the Poplars in the plain.

Below St. Vallier red disappears from the roof-tiles—only the yellows and dull browns characteristic of the south are seen. Two light suspension bridges sweep into sight, uniting Tain on the east bank with Tournon on the west. The multitude of bridges on the Rhone and the excellence of their construction amaze an American. They are old or new, stone or iron, resting on piers or swung boldly across, but they are always admirable of their kind, and in our practical land would be thought far too costly for the humble towns they serve. Tain lies against the foot of a hill once famous for the vines which supplied the "Hermitage" wine, but now ravaged by the phylloxera. All along the Rhone, indeed, many of the slopes, now so yellow and desolate looking, bore rich vineyards before the coming of the pest. Their beauty, however, has not been hurt so much as their usefulness—there is nothing finer to the eye under this brilliant sun and above these green lowland fields than their naked, glowing yellow.

After Tournon one may speak of mountains on the west bank rather than of hills—the mountains of Ardèche, which

keep close to the river for a long distance, sending out to it long irregular spurs with deep gorges between. The next important town on this side is St. Peray, famous for its sparkling white wine, and across the river is Valence, where Napoleon passed certain youthful years—one may read about them in the delightful if untrustworthy chronicle which Dumas called "*Voyage dans le Midi de la France*." This is the first large town since Vienne, and it is admirably set high up on a hillside crowned by its ancient cathedral. Even from the boat one may look across the plains beneath it and see the jagged peaks of the Drôme country rising against the pallid sky. At every step now the landscape grows more southern in aspect and grander in form; and, did we know history as the traveler should, it would perpetually grow in human interest too. No land is richer in picturesque memories than this land of Provence, which still keeps in its name a record of the first conquest of the Romans in Gaul. It was near Valence that we first saw the Cypress-trees, afterwards ubiquitous in churchyard and burial ground.

At Lavoulte, on the west shore, is an enormous castle, rising high from the centre of the town, with great arcaded walls. No one would guess to look at it that it is now occupied by the employees of a neighboring factory. A great plantation of Cypresses gives a touch of dark color to this splendid mediæval picture, and the hills which follow are covered with a close, yellowish grass dotted with low, dusky shrubs. Poplars and Willows still often fringe the bank where the hills do not come close, and far off a wonderful blue mountain with a scalloped outline seems to bar the course of the stream. Then on the west we see, high up, a stretch of railroad borne by a tall viaduct of pinkish stone, and next a high hill terraced to the water's edge, partly by Nature, partly by man. The usually yellow rock is streaked here with pale gray and black, as one finds it so conspicuously much farther south at Avignon and Vaucluse. In spite of the Cypresses and the Figs and the golden rocks, however, there is a reminiscence of the north in an occasional steep, wooded gorge that has a truly Rhenish character. Looking southward at half-past one we saw the finest of color effects. On all sides were distant mountains of the most genuine blue. To the east was a nearer amphitheatre of hills, some vivid green, some pied green and yellow. The sky was blue and the clouds white, but whiter still was the sun-struck river flowing between pure white beaches fringed with low pale green Willows and filmy little Poplars. Human interest was given by a ruined castle on the western shore, and I thought I had never seen a landscape at once so dignified and so lovely, or one where the beauties of the north and the south were so harmoniously mingled. We had a bright sun tempered by racing clouds all the afternoon, and nothing could be fancied more enchanting than the varying effects they produced, sometimes blending all tones into a low, gentle harmony, sometimes bringing out the local color of tree and rock and tower in the most emphatic way against the azure heaven.

After Le Pouzin, with its feudal ruins, and Baix, a little beyond, with a vast ruined abbey and an eleventh-century church, the whitish towns all straggle along close to the water, and the vast old seigneurial structures rise triumphantly above them, with the hillside as a background. Here are beautiful hills, covered with close vegetation, like a bright green carpet, through which breaks the bluish rock, now in great shoulders and now in long stretches of steeply inclined strata. Sometimes all the western shore shows the blue tone of this rock and all the eastern the vivid green of cultivation. Again the hills are gently rounded, with very wide valleys between, running back at right angles from the stream, scattered with tufts of vegetation that do not conceal the bony structure beneath it, and striped by mountain roads like snowy ribbons.

After Rochemaure, where the basaltic rocks are quite purple, and the village was redder than usual, like many of the slopes, we race under another bridge, and reach Viviers, built on a narrow ledge, with a rock wall rising close and high behind the tall Gothic nave of the cathedral and its octagonal Romanesque tower.

Beyond this the hills are very bare, only sparsely dotted with close grayish shrubs and patches of pale grass. The general effect was all light yellow, broken only by an occasional fringe of green by the river; and frequently the rock had weathered to a sponge-like surface. At Donzère came one of the grandest scenes of the voyage, the river running through a defile between close high mountains. At Bourg St. Andréol, which we reached at half-past three, the hills had broken away to the right and the silhouette of the long street stood out sharply against the sky. First came the great white cathedral, with its semi-circular apse, arcaded octagonal tower and low

stone spire ; then a fine sixteenth-century house, where, over the high court-yard wall, showed a mass of deep green foliage and a huge blazing pink Oleander ; then a beautiful gateway of Rococo iron, and then an inn where the whole façade was hidden up to the second story by three huge specimens of *Euonymus Japonica*, growing in tubs and loaded with creamy blossoms. No plant is more common in southern France than this, and none is more beautiful unless it be the Oleander. We do not know in the least what an Oleander is, seeing it of small size, with sparse foliage and scattered flowers. One must see it where it is at home out-of-doors—often a veritable tree in dimensions and covered so close with blossoms that it looks like a huge bouquet.

It was nearly four when we reached Pont St. Esprit, with its ancient bridge dating from the latter half of the thirteenth century. It is 2,500 feet long and rests on nineteen great round arches and three smaller ones, and but for certain alterations made in iron at one end, looks just as it did 600 years ago.

Passing on, the shores stretched out in broad plains, and to the south-east appeared a lofty mountain, almost as white as snow to the top. Soon a single nearer peak came into view, with a jagged long hill beneath it, every point accentuated by a ruin. Wide amphitheatres of hills succeeded, and then a great long cliff of slanting strata, behind which still rose the far-off snowy mount. A castle of the same yellow as the cliff crowned its summit, and the river swept around its base straight toward the east, and skirted another similar cliff bearing another castle. These are the hills of Mondragon and Mornas, and the white mountain is Mont Ventoux which one still sees from Avignon. Nothing more splendid could be fancied than the color here, or than the bold yet harmonious forms of the hills, as steep and naked as walls in their upper portions and sloping and green below. The winding of the river shows them in ever-varying perspectives and each new point of view we think the very best. A little below come flat lands for a change, but with mighty ranges of mountain beyond them. At St. Etienne-des-Sorts we found a nest of yellow houses with a tall-bodied church bearing a tiny square tower. The naked soil was almost orange-colored here, and we knew we were in the *midi* indeed, seeing our first Olive-trees. At a quarter past five we passed two great towers, one round and one square, frowning at each other from isolated rocks across the stream, and, like the rocks, streaked yellow and gray. Looking back we still saw the great white mass of Mont Ventoux, and looking ahead we gazed now south, now east, now west, as the river wound about a succession of broad islands and under the edges of projecting rocks. It was a mighty stream by this time, having been fed by many tributaries since we started, and broadening out around a succession of large islands, yet seeming to flow more swiftly than ever. If every foot of the way had seemed a new delight, how shall I describe the approach to Avignon? The hills break away into more distant amphitheatres. The stream goes east, then turns south, and over its two arms and the green island between them we see afar off a high rock crowned by a diadem of massive golden towers. At this distance, against a sky already reddening for the sunset, it looked like a vision of the New Jerusalem. As we got nearer it was impossible to seize all the features that made up the splendid landscape. There was Avignon itself, lordly on the left bank, and, almost as lordly, the towers and walls of Villeneuve-les-Avignon on the right. Between them were the two wide arms of the rushing pale green stream, with a large bright green island between them, cut by endless rows of pollard Mulberries. The shores were fringed on the right with Poplar groves, while on the left rose groups of tall, black Cypresses. A great stone bridge crossed the prospect in the distance, and nearer were the remaining arches of that famous ancient bridge where, says the nursery rhyme, all the world has danced. Around all stood yellow peaks topped by picturesque ruins, and, still further back, the exquisite blue lines of mountain. It was all beauty, all grandeur, all romance, condensed into a single picture, and as the boat swept up to the *quai*, the western sky burned with a roseate splendor that was reflected from the water in great flashes and turned the yellow castle walls to pink.

The charm did not fade when we saw the inside of Avignon and the panorama from its towers, and from those of Villeneuve across the Rhone. And when to this was added a visit to Petrarch's Vacluse—so often described, so wholly undescribable—it seemed as though, could one see but one beautiful place on earth, Avignon would be the place to choose. Yet one may stay there weeks and never really see it, for its very best shows only when one comes upon it in a summer sunset by the great water highway.

New York.

M. G. Van Rensselaer.

New or Little Known Plants.

Phalænopsis, F. L. Ames.

IT can be said of very few plants that an individual represents all there is of a particular form or variety or hybrid which, not being reproducible from its own seed, must perish with the individual, and so disappear unless the conditions which produced it happen to produce another individual similar to the first. Such unique plants are always interesting in themselves, and the interest increases from a horticultural point of view when they have qualities which make them valuable for their beauty apart from their rarity. Such a plant is the *Phalænopsis*, of which a figure appears on page 29 of this issue. A few roots and three small leaves are all there is to represent this plant, which is a hybrid raised in England by Mr. Seden, the successful Orchid-hybridizer in the Veitchian Nurseries. It was bred from *P. amabilis*, a plant known in gardens often as *P. grandiflora*, fertilized with the pollen of *P. intermedia*, itself a hybrid between *P. rosea* and *P. Aphrodite*. The seed which resulted from this cross was sown in 1882 ; one plant appeared, and five years later (a wonderfully short time for a seedling Orchid to grow to the flowering state) this plant flowered. It was exhibited at a meeting of the Royal Horticultural Society, and was described by Mr. Rolfe in the *Gardeners' Chronicle* of February 18th, 1888, in which a figure of the flower was published, the hybrid being named for Mr. Frederick L. Ames, of North Easton, Massachusetts, to whose collection it was added in the spring of the same year. It has just flowered for the second time at North Easton, and although the plant is in excellent health, it carries only three leaves and is so small that the immediate prospect of increasing it by division is not good. Four flowers were open at the same time this year on the long stout scape ; they were fully three inches across, with pure white sepals and petals. The lip, almost identical in shape with that of *P. amabilis*, is marked with bright red-purple on a ground of yellow or yellow-white, the crest being yellow striped with purple. As Mr. Rolfe has pointed out, the flower "is remarkably intermediate between its two parents, and makes a decided step backward to the *tendrillea* section of the genus." We are indebted to Mr. Ames for the opportunity of figuring this beautiful and interesting plant.

Foreign Correspondence.

The New Plants of 1889.—II.

STOVE AND GREENHOUSE PLANTS.—The most remarkable plant in this division is the gigantic Aroid, *Amorphophallus Titanum*, which, although introduced to Kew ten years ago, did not flower in Europe until June of this year. A description of this extraordinary plant has already been published in GARDEN AND FOREST. I may observe that the plant at Kew is apparently in good health, and beyond losing eight pounds in weight through flowering, the enormous tuber was not otherwise affected. *A. Eichleri*, a small species from the River Congo, has also flowered this year at Kew. It is an interesting and ornamental plant of its kind, but it emits a horrible stench when in flower. *Arisæma Wrayii*, a new species from Perak, with the habit of *A. nepenthoides* and a spathe six inches long, colored white and emerald green, is a pleasing addition to the cultivated plants of this genus. *Arisæmas* are as easily grown as tuberous Begonias, and the flowers of most of them are exceptionally quaint and attractive. *Carludovica palmifolia* is a provisional name for an elegant leaved plant, certainly a *Carludovica*, which Mr. B. S. Williams has introduced this year. *C. rotundifolia*, a near ally of the well known *C. palmata*, from which Panama hats are made, is another addition to ornamental foliage plants, and it is also attractive in its Medusa-like inflorescence and the rich colors of its fruits. It has been in cultivation at Kew some years, but has only recently been definitely named and figured in the *Botanical Magazine*. Mr. Bull offers under the name of *Encephalartos regalis*, from Zululand, a Cycad which resembles *E. Hildebrandtii*. Kew has distributed this year the only noteworthy Palm, namely, *Catoblastus præmorsus*, from Venezuela, with compact habit

and elegant bright green pinnate leaves, as delicate as those of *Cocos Weddelliana*, and likely to prove as useful. Nepenthes receive more attention now than they ever did, and in addition to the numerous seedlings and hybrids in cultivation, we possess many distinct and beautiful species. To the latter Messrs. Veitch have added *N. Curtisii*, var. *superba*, remarkable for the rich brown-purple blotches on its long, elegant, narrow pitchers; and *N. Burkei*, a Bornean species recently described by Dr. Masters, and which is peculiar in having cylindric pitchers, inflated at the base, and wholly destitute of wings. *Sarracenia decora*, a hybrid with pitchers nine inches long, colored reddish brown and tessellated with white, and *S. Wrigleyana*, a prettily marked hybrid from *S. psittacina* and *S. variolaris*, are two distinct additions to the many side-saddle-flowers which are cultivated in English gardens. *Amomum magnificum* has been already mentioned (vol. iii., p. 8); it is likely to become a useful plant in furnishing large tropical

the beauty and useful character of these two plants. *E. Makoyanum* was introduced in 1885 from Brazil, by Messrs. Makoy & Co., of Belgium. *Solanum pensile* is a lovely climber from Demerara, which festooned the rafters of one of the stoves at Kew this year with long pendent racemes of purple-blue flowers, as fine as those of the *S. Dulcamara*, the Bitter-sweet of our hedgerows. *Tecoma Smithii* is a beautiful flowered hybrid from *T. Capensis* and *T. velutina*, raised in the Melbourne Botanic Gardens, and sent this year to Kew, and to Mr. Bull. It is described as being one of the most beautiful of all the Tecomas, the flowers being large, in enormous panicles, and colored bright orange and chestnut. It will be a useful plant for the greenhouse or conservatory, but like all Tecomas, its flowering depends much on its enjoying plenty of sunlight at all times. *Protea nana* is a charming greenhouse plant, with linear Heath-like foliage and nodding terminal cup-shaped flowers, like magnificent *Genethyllus tulipifera*, and colored



Fig. 5.—*Phalenopsis* F. L. Ames.—See page 28.

houses. *Dracena marmorata* is a large species in the way of *D. Lindenii*, but with curiously mottled leaves. It has been introduced from Singapore to Kew and flowered and named this year. *Allamanda violacea* is not new to cultivation, but it had been lost sight of for many years until this year, when plants of it flowered at Kew. The best colored variety of this very interesting species is a first-rate stove flowering plant. *Echites atropurpurea* is another tropical Dog-bane which was in cultivation at the beginning of the present century, and then disappeared again until this year, when it flowered in a garden at Croydon and was sent to Kew as a new plant. It is a free-growing climber, small leaved, with numerous racemes of dark purple flowers, similar in shape to those of *Dipladenia Boliviana*. *Epiphyllum Makoyanum*, a variety of what was introduced in 1885 as *E. Russellianum*, var. *Gaertneri*, but which is almost certainly a third species of the genus, was certificated this year as a new plant. Whatever the decision in regard to names may be, there can be but one opinion as to

rich blood crimson. The Proteas are worthy plants for the greenhouse, and especially for countries where the climatic conditions resemble those of the Cape, where these plants abound. This species and *P. longiflora*, with oblong leaves and erect, large white flowers, have been introduced and flowered this year for the first time at Kew. Another Cape plant, but of a very different nature from the Proteas, is *Drosera cistiflora*, whose flowers were first developed this year at Kew, and were the delight of both botanists and gardeners. A Sundew, with linear leaves on an erect stem, five inches high, and terminated by a poppy-scarlet flower, cup-like and two inches across, could not fail to cause some excitement amongst those who were familiar with the comparatively very small flowers of the common Sundews. It is satisfactory to be able to state that the plant at Kew is growing freely, and promises to be as easy to cultivate as *D. Capensis* and other Cape species. Another Cape Sundew, of much greater botanical interest even than the Cistus-flowered *Drosera*, is *Roridula*

dentata, large plants of which are in the Edinburgh Botanic Gardens. It is a shrub, with hard, woody stems and long linear leaves clothed with viscid glandular hairs, as in *Drosera*; and it bears terminal racemes of white flowers. A shrubby Sundew, attaining a height of three or more feet, and with leaves so sticky as to render the plant, when hung up in the house, useful at the Cape as a fly-catcher, is a novelty of no ordinary kind. Seedlings of it are in the Kew collection. Still another new plant from south Africa is *Gerbera Jamesoni*, which has already proved a charming pot-plant for the greenhouse, and may also prove hardy in the neighborhood of London. It has pinnatifid hairy leaves about a foot long, and single-flowered scapes, the flowers or heads four inches across, not unlike the Paris Daisy in form, and colored bright flame-red. This is certainly one of the best of the new introductions of this year. *Olearia insignis* is a very striking addition to the goodly number of the *Olearias* already in cultivation in England. It flowered for the first time last year at Kew, but I do not remember that it has been recorded amongst garden plants. It has numerous elliptic or oblong leaves, nine inches in length, and the whole plant is thickly felted with white wool. The flowers are on axillary peduncles, and are in the form of the common Scabious, two inches across, orange-colored in the centre, the ray-florets white. It was introduced from New Zealand, and is figured in *Botanical Magazine*, t. 7, 034. *Chironia peduncularis*, the handsomest of the genus, forming a compact shrub, two feet high, with heart-shaped shining green foliage and terminal panicles of erect, Gentian-like, star-shaped flowers, one and a half inches across, and colored rosy purple, is a useful addition to easily grown, free flowering greenhouse plants; *C. palustris*, smaller in all its parts, and fleshier, but a pretty and very floriferous plant, is almost as good. Both these species have lately been introduced from the Cape, and they were this year much admired at Kew. The first named is figured in *Botanical Magazine*, t. 7, 047.

Amongst hybrids raised in English gardens there are, of course, many plants of first-class merit. Messrs. Veitch continue to add beautiful, free flowering Rhododendrons raised from Malayan and Javanese species. It is impossible to speak too highly of this race of plants, which are certain to fill a very large place in all well furnished greenhouses. Streptocarpus, too, is proving a good, useful genus, the various hybrids and crosses recently raised at Kew from *S. Dunnii*, *S. Rexii*, *S. lutea* and several other species clearly proving that a race of plants as useful in the greenhouse as Gloxinias are in the stove may be expected from them. M. Lemoine's new race of Begonias, obtained from *B. Socotrana* and some other species, probably *B. semperflorens*, may be expected to take a favored place among the stove Begonias when once their cultivation, at present a failure in some gardens, is understood.

BULBOUS PLANTS.—Whilst those races of bulbous plants such as the Hippeastrums, Nerines, Liliums and Narcissi have continued to improve in the hands of the breeder of new kinds, there are very few new introductions of any bulbous plants whatsoever to record this year. The only stove bulb is *Crinum Brachynema*, which, although introduced from Bombay and flowered at Kew in 1870, does not appear to have become established in gardens. It has lately been reintroduced in quantity, and flowers of it were sent to Kew for name a few months ago. It has large umbels of pure white, substantial flowers with long tubes, a limb three inches across and fragrant as Cowslips. It is likely to become a rival to *Eucharis* should it prove amenable to ordinary cultivation. *Nerine angustifolia* is remarkable for its very long flower-scapes, some of the plants at Kew this year producing scapes three feet long, and bearing an umbel of about twenty rosy red flowers, similar to those of *N. flexuosa*. *Tigridia Pringlei* is likely to become, a favorite here, though it is very similar to *T. Pavonia* both in form and color. *Gladiolus Leichtlini*, a new introduction from the Transvaal, with bright red flowers like those of *G. psittacinus*, and *G. Adlami*, from the same region, with flowers dull yellow spotted with red, otherwise similar to *G. cardinalis*; these two new species have been flowered at Cambridge. The hybrids *G. turcensis* and *G. Nanceianus* are both very beautiful breaks of continental origin, being large in flower, distinct in shape and beautiful in colors. They are the progeny of *G. Saundersii* and *G. Gandavensis*, and are perfectly hardy in England. Messrs. Veitch & Sons exhibited a collection of the Nanceianus race before the Royal Horticultural Society this year, and they were generally admired. *Watsonia iridifolia*, var. *O'Brieni*, is a pure white flowered variety of a robust, free flowering, easily grown plant, and is likely to become popular. It is the plant which Mr. Goldring mentioned as *W. iridifolia*, var. *alba*. It was in-

troduced from south Africa by Mr. O'Brien, of Harrow. *Lilium Wallichianum*, var. *superbum*, is a noble Lily from India, introduced and flowered this year by Messrs. Low & Co. It has a stout stem, six feet high, bearing three or four flowers, each nine inches long and six inches across the limb, the color milk-white with a pale yellow throat. The Indian Liliums are difficult to establish in English gardens, otherwise they are first-class. We have now *L. Nepalense* (introduced last year), *L. Neilgherrense*, *L. Philippinense* and *L. Wallichianum*, but they gradually weaken under cultivation. A new variety of *L. longiflorum* from Hong-Kong and the newly discovered *L. Henryi* from China are in cultivation at Kew, but they have not yet flowered. *Fritillaria Bucharica*, from central Asia, is an interesting species with whitish flowers borne singly in the leaf-axils near the top of the stem. *Galanthus Fosteri*, from the province of Sirwas, in Asia Minor, has flowers like the larger forms of *G. Elwesii*, and leaves as broad as in *G. latifolius*. Although not new plants, it may be worth recording of *Anomatheca grandiflora*, *Anoganthus brevifolius* and *Cyrtanthus luteus*, three south African plants which have not yet got far beyond botanic gardens, have proved exceptionally easy to manage, very free flowering, and sufficiently ornamental to take a place among small bulbous plants for the cold house or frame.

HARDY HERBACEOUS AND ALPINE PLANTS.—The best of the new plants in this department are several Irises, notably *I. Gatesii*, from Turkestan, related to *I. Susiana*, but larger and better in color even than that superb plant; *I. Barnumæ*, an Armenian species of the *Oncocyclus* section, but with large purple flowers like the German Iris, and *I. Bakeriana*, also from Armenia, with the habit and appearance of *I. reticulata*, the flowers purple and yellow, fragrant as violets, and appearing in February or even earlier. *Spiraea Kamtschatika*, recently introduced and named *S. gigantea*, a plant like our Meadowsweet, but much larger, attaining sometimes a height of ten feet, the enormous panicles of white, feathery flowers, very fragrant, is likely to prove valuable for bogs and swamps. It was exhibited recently by Mr. G. Paul. *Primula petiolaris* and *P. Poissoni* are small though pretty additions to this already largely cultivated genus. *Primulina Tabacum*, an interesting Gesneriad from China, is one of Dr. Henry's discoveries which flowered at Kew this year. It has a tuft of obtuse, lobed, leathery leaves and erect viscid scapes of Phlox-like flowers, one inch in diameter, violet colored and exhaling an odor of tobacco. *Podophyllum pleianthum* is another Chinese plant which Dr. Hance described as one of the most interesting discoveries he ever made. It flowered at Kew this year. The leaves are peltate lobed, a foot across and shining green, while the flowers are not unlike those of the Snake's-head and colored deep crimson. *Clintonia Andrewsiana* is a Californian Liliad of some interest with terminal umbels of rose-red flowers not unlike some of the *Aliliums*. *Calandrinia oppositifolia* is a Californian perennial which this year was very attractive out-of-doors at Kew; it bears white, star-like flowers two inches across. *Kniphofia Natalensis* is a slender species with pleasing, orange yellow flowers, not so attractive as the popular garden kinds, but still an interesting plant and of some ornament.

TREES AND SHRUBS.—The only noteworthy introductions amongst these are *Rosa gigantea*, a magnificent species from the high regions of upper Burmah, and likely to prove hardy at Kew. It has enormous, cup-shaped flowers, six inches across and snow white. *Cornus Sibirica*, var. *Spathii*, is a variegated leaved form of a useful garden shrub, and *Skimmia Foremani* is useful either for out-of-doors or as a pot plant for in-door decoration in winter.

Kew.

W. Watson.

Entomological.

A New Elm Insect.

(*Zeuzera pyrina*.)

SCARCELY a year passes nowadays that does not bring to light some insect newly imported from a foreign country. These importations are in no case desirable acquisitions, and, as a rule, become our most destructive pests. The Elm has suffered for some time from the attacks of the imported Elm-leaf beetle (*Galeruca xanthomalana*), and now it seems settled that another pest has gained a foothold among us, and threatens destruction to our Elms by boring into the branches.

This species is the *Zeuzera pyrina*, Fabr., in the imago stage a very handsome white moth, rather closely spotted with black, as shown in the figures.

For several years back single specimens of the species have

been found in the city of Newark, and their occurrence has been deemed accidental, owing to the small number; but they increased steadily, and for the three years last past they have been numerous around the electric lights along Broad Street, especially near the parks containing many Elms. This occurrence pointed to the Elm as their probable food-plant, and some

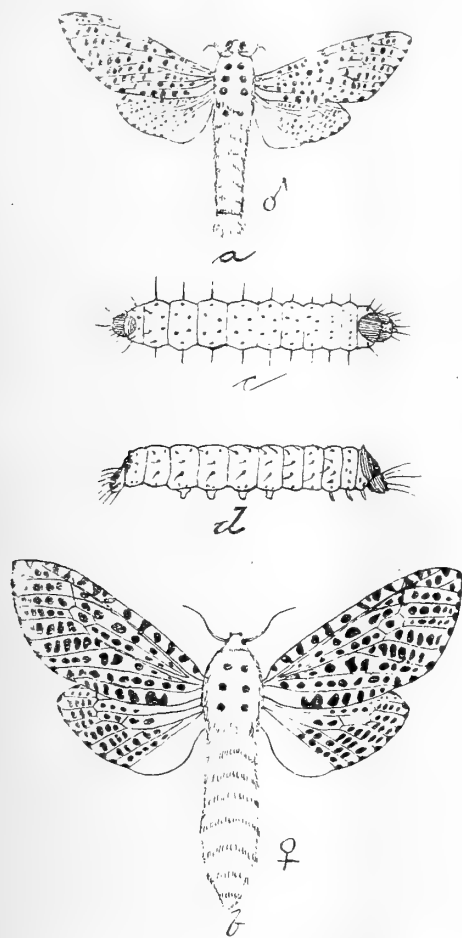


Fig. 6.—*Zeuzera pyrina*.

a, Male moth; b, Female moth; c, Caterpillar, dorsal view; d, Caterpillar, lateral view.

of the Newark collectors tried to find the early stages, but sought them in the trunk and roots without success. Finally Mr. Angelmann, examining the branches of a felled tree, found the larva of the borer in considerable numbers in the smaller twigs, and in burrows in larger branches found also the pupa. The moth, it seems, deposits its eggs in the fork of a small branch, and the young larva burrows downward toward the larger branches, tunneling generally through the centre, and usually killing the branch. In color the larva is whitish, as is usual with borers, with black dots, each bearing a single hair, arranged as shown in the figure, which also gives very well the general appearance of the caterpillar. I understand that the terminal branches of many of the trees in Newark have been noticed to be dying, but the cause has not been heretofore discovered. There is little doubt that this insect is responsible for the injury, and that it has gained a firm foothold. That it is spreading is indicated by the fact that during the season of 1889 it made its appearance at Arlington, a suburb of Newark. The insects are attracted by light, and many hundreds of them are drawn to the electric lights and destroyed; these are mostly males, however. There is no reasonable doubt that this destruction of the moths has done much to prevent a more rapid spread, and it is to be feared that once out of the influence of the electric lights their march will be rapid.

As to remedies, I have no suggestions to make at present. Borers are hard to deal with at best, and a borer that attacks branches from sixty to seventy-five feet above ground is an especially unsatisfactory creature to deal with. Heroic remedies would be best here, and I would recommend free cutting and burning of affected branches as the best means of checking their increase and spread.

Rutgers College.

John B. Smith.

Cultural Department.

Rose Notes.

THE closest attention is needed in the Rose-houses during midwinter to ensure success, and all extremes should be avoided, not only in moisture, but in heat and ventilation; in fact, but little of the latter will be necessary until the sun gains power and the days are perceptibly lengthened.

In many instances the crop will have been cut to a greater or less extent during the holiday season, and the next care on the mind of the grower is to make his Roses break well again for the following crop. With this in view, a little extra stimulation in the form of liquid manure may be given, or else a light sprinkling of hen manure may be applied to the surface of the beds. The latter should, however, be used with caution, as its action is somewhat similar to that of guano.

In the matter of watering, much judgment must be used, as an open, porous soil will allow of much more water without injury to the plants than can be safely given to those planted in heavy, clayey soil, which are, upon the whole, rather difficult to keep in the proper condition during bad weather. In either case it will be found that some portions of the beds will dry out much faster than others, and therefore will need much more frequent waterings. During the sharper weather to be expected in January, the firing will naturally be more brisk, and there is in most greenhouses an extra warm and dry corner, especially in those where the boiler is built into the end of the house, and it is in just such places that red spiders are likely to flourish if undisturbed.

To avoid the spread of these pests, special care should be given in syringing these dry corners, so that the spider cannot secure a foothold.

Malformed and knotty buds are frequently seen on some varieties at this season, and they should be cut off as soon as discovered, since it is a waste of the energies of the plant to allow it to finish the growth of such a bud, apart from the valuable time lost by the grower while waiting for the development of a flower finally decided to be worthless.

Good Roses have been rather scarce during the past holiday season, the mild weather of December having disarranged the calculations of many growers. In addition to the high temperature, most of the month was very damp, both of which conditions were far from beneficial to the Rose-crop. In fact it has been anything but an ideal season for Rose-growing thus far, and this serves to impress upon the minds of growers the truth that although a Rose may be an every-day kind of plant, yet it is not an every-day occurrence to see a house of Roses in perfect condition.

The early crops of Hybrid Perpetuals have not been up to standard in many cases, though some good houses are to be seen, while others have proved total failures. This latter condition was not a surprising one on account of the excessive rains of the past summer, the frequent downpour rendering it almost impossible to properly ripen the wood for early crops. Among the earlier hybrids Mrs. John Laing and Madame Gabriel Luizet take a prominent place, these being among the most beautiful of pink Roses, and both are readily forced.

Each of these two excellent varieties has many admirers, Madame Luizet being, perhaps, the largest flower, though Mrs. Laing possesses some advantage in point of form.

It is said that Wootton is producing the best result in the hands of the introducer. Possibly the needs of this variety are better understood there than elsewhere.

Another addition to the list of Roses is now offered by a western firm in the form of a sport from Papa Gontier. From the description, this new candidate for public favor seems to be of questionable merit, the novel feature being its variegated color, which is more or less splashed with different shades. It does not appear that this would be an improvement on the type.

Holmesburg, Pa.

W. H. Taplin.

Christmas Roses.

SINCE the notes on these plants published in GARDEN AND FOREST of January 1st were written, other species and varieties of Hellebores have come into bloom, namely: *H. orientalis*, *H. abchasicus*, *H. niger*, *H. niger angustifolius*, the variety known as the Scotch, or Wardie Lodge form, and *H. niger maximus*. They make a very interesting group, thanks to the abnormal mildness of the season, and they were equally good last year. The winter of 1888-9 and the present one, so far, have been distinctly English, and our Hellebores have flowered above the snow (when there has been any), actually

and not "traditionally," as seems to be the case with Mr. Gerard's plants. I have grown Hellebores both in England and Ireland, and the growth made by plants here equals in every way that made in the British Islands, and there is no reason to doubt that if Hellebores are so planted that they may be covered with a cold frame in the event of cold weather, these beautiful flowers may be had in perfection in America, even in severe seasons, as frost has no injurious effect on the flower buds, and the sunshine of bright days would be sufficient to fully expand the flowers. As to exposure to the sun in summer, it must be taken into consideration that M. Correvo's cultural directions, when applied to this country, should be adopted with some modifications. We have found that in light soil, during protracted dry weather, the large, leathery leaves become veritable signals of distress unless water be applied; hence the advisability of planting in

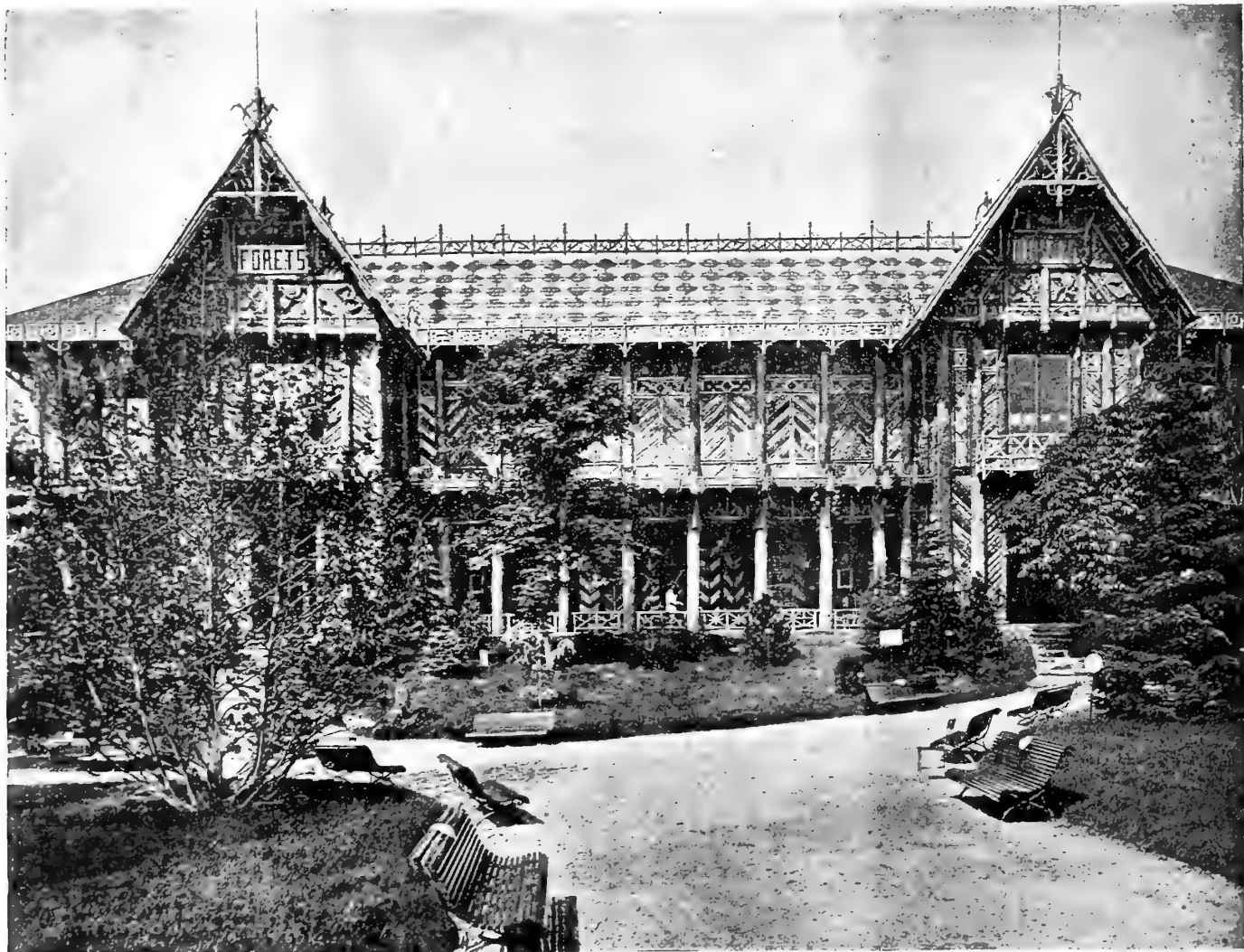
known as it should be, taking into consideration the fact that no other flowers are to be had out-of-doors, even in a mild season like the present.

Passaic, N. J.

E. O. Orpet.

Propagating Chrysanthemums.

IN the last issue of GARDEN AND FOREST a Japanese authority is quoted as saying that Chrysanthemums are sometimes propagated in his country from a single leaf with the bud at its base. Permit me to add that at the November Chrysanthemum Conference, in London, Mr. R. Beale exhibited some small Chrysanthemum plants, said to have been grown from leaves only, and they were naturally objects of considerable interest. In a note to the *Gardeners' Magazine*, in the same month, Mr. Beale explains that these plants were not strictly obtained from the leaves only, but that the axillary bud was



The Forest Pavilion at the French Exhibition.—See page 26.

soil of a retentive nature, when the preference is to be had. An examination of the roots of Hellebores will show that the young growing parts are covered with minute root-hairs or feeders, and these must, of necessity, suffer severely in the event of drought. As to the proper time for division, while it may be possible to divide the plants after the foliage is matured in June, we would not risk advising any one to perform the operation at this season, unless he had time to nurse his plants afterward, while it may be done safely and easily in early spring before growth commences, or in September, when strong sunshine is past. It is rather difficult to understand how a "warm cold frame" differs from "a cold house from which frost is excluded," as in either case the plants must be lifted again in spring. The placing a cold frame over Hellebores in their permanent quarters would hardly chill the enthusiasm of any lover of flowers. Recent visitors here have expressed surprise that these plants could be grown in eastern gardens, and there is no doubt that this is not so generally

used with it, a V-shaped cut being made in the stem, and the bud with the leaf attached being used without any wood and struck in fertilizing moss. Mr. Beale claims that such cuttings almost invariably strike, and also that he can get rooted plants from leaves without the bud, though the growth is much slower. The Chrysanthemums can no doubt be increased readily in the first way suggested, and perhaps with leaves only, though the cultural skill and care required in this latter case would be considerable, and the growth would be so weak and slow as not to be of much utility. Mr. Beale believes that this method of propagation will be valuable where a large stock of a new variety is required, but it is difficult to see wherein it is an improvement on layering the flowering stems when stock is scarce and large increase is wanted. The Chrysanthemum is a very accommodating plant, ready to throw out roots from all parts except the flower, and hence it is rapidly multiplied. Detached flowering stems of this plant, if laid in a cold frame and slightly covered with soil, will throw

out strong shoots from every perfect joint, and these can be taken off as cuttings and quickly make strong plants. This is much simpler than Mr. Beale's plan, requires little care, and produces, of coarse, the same number of plants, and probably stronger ones. On New Year's day, to give a practical example, I lifted a stem which had been laid in a cold frame about the middle of November. This had borne a specimen flower and is a foot long, with two weak side shoots, and it had twenty-six shoots in fine condition, though some were quite small. Half the stem gave no shoots, probably because the buds had been taken out in cultivation. Now, it will be seen that one could put this stem in gentle heat, and in a few weeks make a set of cuttings, and these grown along will make others, and as these increase, in a geometrical ratio, I think I am safe in saying that a good propagator would turn out from 150 to 200 plants from this stock by planting-time. Such an increase should satisfy the most exacting.

Because Chrysanthemums are almost necessarily protected by glass in the blooming season, there seems to be an increasing tendency to treat them all through as greenhouse plants. A plant which, after blooming with the greatest profusion, and thus being in a weakened condition, will live out-of-doors in a well drained border, in our climate, with such protection as is ordinarily given to most of the so-called hardy plants, and then "strikes" readily and naturally in a temperature of forty to fifty degrees, is scarcely to be classed as a greenhouse subject. The professional growers propagate and bring on their stock in heat very successfully, but it is not an example for the amateur to follow, except perhaps in the use of very slight bottom heat in striking, when necessary. For the general stock, cuttings in the cold frame will almost invariably root during the winter, and are not so liable to harden up and become worthless, as those grown along in the house. Mildew, however, is the enemy to be watched in this case, and frames should be aired at every opportunity. Most of our growers have discarded early cuttings on account of this liability to mildew. Amateurs will have satisfactory results if they plant their stock-plants closely in cold frames, and protect them well, although a little frost will not injure the plants. Cuttings should be dibbled out in February or March, in the same place. They will soon root, and should be given all possible air, with protection from winds, and planted out at the earliest possible moment.

Elizabeth, N. J.

J. N. Gerard.

The Loquat and the Medlar.

THE Medlar (*Mespilus Germanica*) is a native of Europe, where it is frequently met with in its wild state; but in several of the southern states the fruit is becoming quite popular. In Germany it ranks very high as a common fruit, and large quantities are disposed of on the market-stalls of all the principal cities. When the seeds were first brought to this country it is difficult to say, and there is very little information to be obtained about it from any American books on fruit culture.

The Medlar reached Florida from New Orleans, having been brought there by some of the French Jesuits. It has now been growing in the Florida gardens for thirty years, and, in sections of the upper part of the state, the bushes are frequently met with in a semi-wild state. The fruits on these uncultivated plants have degenerated greatly, and present a strong contrast to those found in the gardens and groves of the white settlers.

The tree is small but handsome, and in Europe it is used for hedges almost as generally as the Osage Orange is employed for like purposes in this country. When the fruit is thoroughly developed and matured on the tree it has a dark brownish skin, with firm, austere flesh. It is of fair size, and very palatable after it has been kept until the first stages of decay, called bletting, has thoroughly softened the flesh of the pulp. It has a rich, subacid flavor then, which is highly prized by many who have become accustomed to the fruit.

The Medlar is usually propagated from seed; but in many sections of the south it has been budded or grafted on the Pear with great success. It has close affinities to the genus *Pyrus*, and by many botanists it is classed as a member of this genus.

The Loquat (*Eriobotrya Japonica*) is a related species to the Medlar, and in many sections of the south it passes under the misnomer "Japan Plum." It is grown quite extensively in the Gulf States, where it reaches its highest perfection; but in many instances it is planted more as an ornamental tree than for the fruit. The tree is a small but handsome evergreen, with thick, leathery, lanceolate leaves, highly polished on the upper side. In the fall of the year the blossoms, of a creamy white color, appear in large terminal spikes, and exhale an

agreeable fragrance, scenting the air almost as generally as the Orange blossoms. In early spring the flowers drop off, and clusters of yellow fruit appear.

The fruit grows in clusters as close as grapes, with a thick skin of a dull pinkish color, and about the size of an ordinary plum. Most of the fruit has a delicious, pleasant subacid flavor; but there is a manifest difference in the size and flavor of the fruit in different sections of the south. There are no distinct varieties described; but some of the trees produce fruit that is very sweet and agreeable to the taste, while others are too acid to be eaten with any degree of pleasure.

The tree is propagated from the seed, and it may be seen in nearly every ornamental southern garden. In the sections of the south where frost is heavy the tree becomes blighted, even while the flowers and fruits are forming, so that it can really never amount to anything as a fruit producer. Going farther south, however, we find that, in the lower counties of Florida the Loquat blooms and matures its fruit during the winter season without interruption from cold, which in the spring offers a tempting feast to all who relish it. The first fruit appears the last of February, just when other fruits are scarce in our northern markets.

New York.

George E. Walsh.

Dracæna Lindenii.—This makes a fine exhibition plant, and has great value for general decorative work, being especially useful for single specimens in vases. It is of recent introduction, and does not differ in its growth from the *D. fragrans*, but the broad, arching leaves of green are beautifully ornamented with a wide margin of creamy yellow, which gives to the plant a very attractive appearance and places it in the front rank of variegated plants. It is propagated easily by the usual method of layering or cutting up the canes, but to make good specimens, fit for exhibition purposes, the heads alone must be used, and these with care will make a fine crop of roots in a few weeks without the loss of a single leaf. *D. Massangeana* makes an excellent companion plant for the foregoing, only differing from it in that the variegation runs through the centre of the leaf instead of along the margin.

Ficus elastica variegata.—Mr. Taplin has not spoken any too highly of the merits of the variegated Rubber plant (ii., 620). We use it for house decoration, and find it quite as hardy as the common kind. We have never experienced any difficulty in rooting the cuttings whether by eyes or by tops. We have rooted a good many lately in a very warm, close frame, with about three inches of fine coal ashes and a brisk bottom heat.

Homalomena (Carmeria) Wallisii is not grown so generally as it should be. It is a handsome plant, belonging to the *Aroideæ*, of low-growing habit, not more than nine inches high, with drooping leaves, six to eight inches long by five inches wide, ovate-oblong, and pale velvety green, copiously blotched with golden yellow. The under surface is dull red. The flowers are rather attractive, the spathe being about three inches long, constricted in the middle and reddish brown, while the spadix is red. To ensure good leaves, however, the flowers should be picked as soon as seen. We grow this plant in the warmest house, potted in a mixture of peat and moss and keep it very wet. Under this treatment it gives great satisfaction. It should be propagated by division.

Kenwood, N. Y.

F. Goldring.

Sowing Seed.—Let me add to Professor Bailey's admirable article that the importance of care in the preparation of the soil is sadly underrated. This care is usually given in proportion to the cost of the seed; that is, a novelty of high price receives due attention, and for this reason rather than for any real superiority, it may excel older sorts. The market-gardeners of Long Island, as a rule, buy their Cabbage-seed of a neighbor who has a reputation for a choice variety; something far superior, he thinks, to anything to be obtained at a seed-house. Market-gardeners pay from twelve to fifteen dollars per pound for this seed, when equally good seed could be bought at a reliable house for three dollars. But the fifteen-dollar seed is the cheapest for the gardener in the end, because he sows thinly in soil prepared with the greatest care. The result is that most of the seed germinates, the plants have sufficient room for development; they do not get "leggy," but are strong and stocky, and in the finely-pulverized, but well-compacted, soil they are well furnished with roots. When these plants are set in the field they do not suffer from the change; their vigor pushes them ahead, they are quickly established, and yield a large proportion of well-developed heads. Low-priced seed, purchased by the same gardener, would have been sown more thickly in loose and coarse soil, where the plants would have been long-drawn, poorly rooted

and without vigor when transplanted. The product from such a beginning will be late, small and of inferior quality. This is not an imaginary case. I have seen seed from the same stock give the best satisfaction, and in other cases none at all. The sole reason for these opposite results was that in one instance the seed was sown properly, and improperly in others. I have more than once noted experiences of precisely this character among the growers of Cauliflower in Suffolk County.

Floral Park, L. I.

C. L. Allen.

Tuberous-rooted Begonias.—Now is the time to sow seed of tuberous Begonias for bedding, or for making showy pot plants this season. Sow in pans in, or rather on (for the seed needs no covering), a mixture of sifted leaf-soil and peat, using the siftings to cover the drainage. Set the pans in saucers, where there must be sufficient water to keep the surface moist by absorption. Place pieces of glass over them, tilted to admit air, rather for protection against careless watering and syringing than for the purpose of keeping them "close." Sixty degrees, night temperature, is sufficient for germination. Gradually remove the glass as the seedlings develop, and prick them out when large enough to handle in soil containing some loam. Increase the quantity of loam at successive stages, and give some shade in the middle of the day as the sun attains power. Plant out in June. A shady situation is generally recommended, but there is a difference of opinion. Save your own seed. In doing this you will succeed best with pot plants.

Wellesley, Mass.

F. D. H.

Correspondence.

The Forest-floor.

To the Editor of GARDEN AND FOREST:

Sir.—While I appreciate and subscribe to the main idea of the editorial in GARDEN AND FOREST for December 18th, allow me to call your attention to an expression which may eventually give trouble to those who wish to convince others of the influence of forests on waterflow.

You refer to the spongy condition of the forest-floor, and it is quite an accepted theory that the forest-floor "acts like a sponge, taking up large quantities of water and gradually giving it up to the soil." Even scientific men are apt to use this simile. Now, this is not the action of a sponge, as a simple experiment could prove. While some forest-floors—by no means the majority—do act like a sponge, they are by that very action depriving soil and springs of a considerable share of water.

It is curious that the simile has been used so frequently without an attempt by somebody to first study the action of a sponge. It is simply this: after the sponge is saturated with water, and not before, it will give out water below if more water is added above—that is to say, if the water in the sponge is driven out by pressure of more water. As soon as the supply from above stops, the sponge will stop giving out water from below, except so far as it contains more water than it has capacity to hold. After that, the movement of the water is upward, not downward. Evaporation begins, the upper parts become dry and supply themselves with water from the lower strata by capillary action. Thus, while a spongy floor would do the one thing claimed for it—namely, "retain the water in the spongy mass" and diminish the water which runs off—it would not do the other thing which is implied, namely, furnish gradual supplies of water. This it could possibly do only if the underlying soil strata had become dry earlier than the spongy cover, which is the case only rarely and under exceptional conditions.

The question, then, is, how far does the forest-cover resemble a sponge? Fortunately for water supplies in springs, the resemblance occurs more rarely than the general use of the simile implies. A sponge is a material with remarkable powers of capillarity, as can be seen when placed in a puddle of water, which it will drink up with avidity. Such capillarity in a minor degree may be found in some moss covers, and the consequence is that the amount of water held and afterward evaporated—but not given up to the soil—is quite astonishing. The quantity of water thus retained may amount to from seventy to eighty per cent. of its weight, so that if the moss-cover exceeds a depth of four or five inches it may withhold nearly all the water from the soil, except of heavy rain-falls and snows, and this water is lost by evaporation twice to three times as fast as from other litter; whether an additional amount of water and how much of it will run off superficially or be filtered into the soil, depends largely upon the nature of the latter.

The various kinds of litter, which, after all, form the greater part of forest floors, appear and act, indeed, quite differently from sponges; their capillarity, as can be inferred to some extent from their rate of evaporation, is only small, and they will filter through to the soil much larger amounts of water than the moss (thirty to forty per cent. more). This kind of soil cover, like the moss, does also require a considerable amount of moisture to saturate it, but less than the moss-cover; it loses less by evaporation and gives up more water to the soil.

Altogether, we will have to admit that the forest-floor not only retards the run-off, but it diminishes the amount of water which percolates into the soil. And yet it acts beneficially upon the steady flow of springs by checking evaporation—the greatest dissipator of water supplies. Regularity of flow in the springs, brooks and rivers, as far as it depends upon forest-cover, is due to reduced evaporation under the protection of forest-shade and forest-floor.

The mechanical retardation of the run-off, which the irregularities of the forest-floor and the trunks, stumps and underbrush produce, will certainly tend to reduce the height of freshets in brooks by distributing the flow of water masses over a longer time. But it would be an unwarranted, easily demolished generalization, to say that this retarding influence is everywhere useful in preventing floods of rivers. It may, on the contrary, prove the very source of danger—geological, geographical and topographical conditions being most potent in altering the value of this influence.

It would lengthen this communication too far to argue the influence of forests on floods in general; my purpose is simply to object to the popular idea that a forest-floor acts like a sponge, and to insist that even the admitted retarding influence of the same may not in all cases and everywhere be a benefit.

Washington.

B. E. Fernow.

Mr. Eyerman's Orchids.

To the Editor of GARDEN AND FOREST:

Sir.—During the past three years Mr. Eyerman, of Easton, Pennsylvania, has been making a collection of Orchids which now fill three houses, and a large conservatory has recently been added, containing a fine collection of Palms, Ferns, Cycads, etc., among which Orchids in bloom are tastefully arranged. In this structure I noticed on a recent visit scores of *Lælia autumnalis*, and its showy variety, *Atrorubens*, there being no fewer than fifty spikes crowded with blossoms. *L. albidula* was equally well flowered, most of the plants being on blocks, and bearing unusually strong spikes of well formed and very large flowers. *Lælia Gouldiana*, a very scarce plant, was well represented here by a spike carrying several of its rich purple blossoms, and here, too, were many examples of the charming scarlet-flowered *Sophranites grandiflora*. Some fine Cypripediums of the Insigne type, flowering for the first time, were very interesting, many of them being distinct in character, and among them was a splendidly grown plant of *C. Leeanum superbum*, with twin-flowered spikes, and flowers of great size and exceptionally bright color. Here, too, was a good example of *Vanda cærulea* carrying a dozen of its lovely blue flowers, and near by *Oncidium tigrinum*, with well branched stems laden with rich yellow and chocolate blossoms.

In the house devoted to the Cattleyas and Lælias many choice plants were promising flower. *C. Trianae* and many of its varieties will soon make a fine display, as will the scarce *C. Lawrenceana*, well grown specimens of which were furnished with strong flower-sheaths. *C. Percivaliana* was represented by several large plants, and among the Lælias were quantities of finely flowered *L. anceps*, and its white variety, *L. anceps stella*, carrying three well developed spikes. This variety has hitherto proved somewhat difficult to manage, but Mr. Mænner, the gardener here, has been very successful with it. The plants in baskets are well exposed to the light, and during their growing period receive a liberal supply of water with an abundance of air. In this house the pretty *Angracum Sanderianum* was seen, and some enormous spikes of the yellow-flowering *Oncidium Cavendishianum* were rapidly pushing for bloom. A fine variety of *O. Forbesii* was very conspicuous, its chocolate and golden-yellow flowers growing in quantity on a well branched stem. Fine examples of *Odontoglossum Harryanum* and *Compactia Macroplectron*, with its rosy pink flowers, were in excellent health, and at each end of the house were two handsome specimens of *Cymbidium Lowianum* almost ready to bloom.

In the Cypripedium house, among the rarer varieties, were noticed a grand specimen of *C. calurum* and *C. grande* was in superb health, together with *C. meirax*, *C. plumerum*, *C.*

Mrs. Charles Canham, *C. Barteti*, *C. tonsum*, *C. nitens*, *C. Arthurianum*, *C. Fairrieum* and many others. In a lean-to structure, with a northern aspect, the *Odontoglossums* were in luxuriant health, the majority being of the *O. crispum* type, with stout bulbs and broad-petaled flowers. *O. Pescatorei*, *O. triumphans*, *O. nebulosum* and many more were thriving in a like manner. On the stage at the back of this house were some grand specimens of *Cypripedium insigne* in bloom, about 200 flowers being well expanded, and from the roof were suspended many fine specimens of *Oncidium ornithorhynchum*, *Epidendrum vitellinum*, *Masdevallias* in many varieties, and a fine lot of the pretty *Lalia Dayana*, and its varieties, *Pumila Præstans* and *Marginata*.

Summit, N. J.

A. Dimmock.

Game Covers.

To the Editor of GARDEN AND FOREST:

Sir.—At the annual meeting of the Massachusetts Fish and Game Protective Association, held on January 8th, an instructive address was delivered by Professor B. M. Watson, Jr., of the Bussey Institute, on the subject "How best to preserve and increase the supply of natural food for game birds, and the best means of affording shelter for them."

The address was given in view of the fact that the Association contemplates the importation of valuable game birds of various species from the west and south, to be released in eastern Massachusetts in the spring; and the problem of supplying food and shelter is one of importance to those interested in birds. Professor Watson spoke of the adaptability of various trees, shrubs and grasses. He instanced the fact that many wild birds—quail, grouse and others—frequented the grounds of the Arnold Arboretum, where they are never molested, and where the natural fruits and seeds of various shrubs and plants contribute to their food supply, and he considered that such preserved lands greatly contributed to the welfare of game birds. As the work of introducing and establishing shrubbery for shelter, and fruit-bearing plants must necessarily be slow, the speaker recommends that many waste places—openings in woods, unused pasture lands, etc.—be sown annually with various cereals, particularly Buckwheat, which would yield quickest returns. In Europe for many years past the game and game-preserves have been artificially propagated, and the time has come when we must pursue a similar course or see our few game birds disappear.

The danger from forest fires is perhaps the most serious one to be met, as doubtless more young birds, nests, and even sitting birds, are destroyed by fire each year than can be estimated, not to speak of the wholesale destruction in this way of valuable cover and fruit-bearing vegetation.

Boston, Mass.

John Fottler Jr.

The Mild Winter.

To the Editor of GARDEN AND FOREST:

Sir.—The effect of the unusually warm December was seen here in the opening leaves and swelling buds of many trees and shrubs in the college-grounds. *Spiræa Thunbergii*, *S. prunifolia* and *S. sorbifolia* were putting out leaves. Of the Honeysuckles, *Lonicera flava* and *L. sempervirens* were betrayed into the same fatal activity, while *L. Halliana* had not ceased its autumn growth. Lilac buds were ready to burst, and the blossom buds on Japan Quince, Silver Maple and Cottonwood showed a fullness quite hazardous for this changeable climate. On the 29th of December the temperature dropped to two degrees above zero, and has alternated between that point and sixty degrees above since then.

The following shrubs still hold their leaves on January 7th, and a good deal of their autumn brightness: *Ligustrum vulgare*, var. *buxifolium*, *L. ovalifolium*, *Lonicera Halliana*, *L. fragrantissima*, *Cotoneaster buxifolia* and *Cytisus capitatus*.

It is to be regretted that *Ligustrum ovalifolium* is so tender with us, having killed back nearly to the ground during the past two winters, for its stiff, shining, dark green leaves are conspicuous all through the fall and early winter, acknowledging the frosts only by a slight deepening of color and an occasional purplish tint.

Kansas Agricultural College.

S. C. Mason.

A Garden Conceit.

To the Editor of GARDEN AND FOREST:

Sir.—A charming garden conceit is being carried out in the Royal Botanic Gardens at Dublin by the Curator, F. W. Burbidge, through whose intelligent care these gardens have become among the finest in Europe. "I am making a Bamboo walk," he writes, under date of December 20th, "and I have to plant the margins of a pond and to make a dripping

well with an old Irish cross on it, so that all the maids who visit us may breathe their wishes at the fountain and find them all come true."

G. H. E.

Rochester, N. Y.

Periodical Literature.

It is encouraging to find in a widely circulated popular periodical so strong a plea for the right treatment of a piece of the nation's property as is contained in the January number of the *Century Magazine*. The editorial headed "The Care of the Yosemite Valley," could not be more to the point or more judicious in tone. Beginning with a reference to the policy of "an active member of the Yosemite Valley Commission," who proposes to "cut down every tree that has sprouted within the last thirty years," it says that a crisis in the management of the valley is probably near at hand, distinctly explains why the whole country has as much right as California to express its wishes, and then shows what these wishes should be. The main question to be decided is whether "the treatment of the Yosemite landscape has been intrusted to skillful hands;" and from the results of a recent investigation by the Legislature of California and from numbers of photographs "showing the condition of the portions of the valley before and after the employment of the axe and the plow," the editor concludes that "the valley has not had the benefit of expert supervision." Then he says that though the commissioners, present and past, should not have their good faith impugned, and though "it is no reproach to them that they are not trained foresters," yet their responsibility begins with the very recognition of this last fact; "for, in the absence of knowledge of a professional nature, it should be their first aim to obtain the very best man or men available for this work. No such expert is too good or too expensive, and no claim upon the budget of California should have precedence of this." But there is as yet no certainty that this truth will be acted upon. There is every danger that future commissioners may think of everything else—and especially of facilities for transit—rather than of the preservation of the beauties of the valley. As it is tellingly put: "They may think it is more desirable to improve a trail than to preserve the sentiment for which the trail exists." Nothing could be truer than the following sentences, and we trust they may sink deeply into the minds of the hundreds of thousands whom the *Century* reaches: "To contrive means and methods by which that which is most distinctly valuable to the world in the Yosemite can be perpetuated, and to provide means by which the world can conveniently and effectively make use of it—which means shall be in the least degree possible conspicuous, incongruous, and disturbing to the spirit and character of the scenery—is a problem that no amateur ought to dabble with." Following this editorial essay came three "Open Letters" on the same subject, describing personal impressions received by men who are competent and impartial judges. One is from Mr. George C. MacKenzie, of Wawona, California, who speaks chiefly of the "absolutely shocking use that has been made of the wood-chopper's axe—deadliest foe, in reckless or ignorant hands, of woodland beauty; deadly unless guided by a mind of most rare attainments in the craft of artistic forestry." The writer goes on to say that "there are places in the valley where one is forced to wonder why the axes themselves did not turn and smite the men who were putting them to such base uses," and that "under the system by which the Yosemite is governed there is no saying when the work of the devourer of beauty may not again flourish," although it happened to be checked last year. Indeed, this is the main point. It is useless to try and make individual wrong-doers responsible for the destruction that has gone on. They "are merely the natural fruitage" of the system which intrusts the management of the valley to a board of commissioners who serve for short periods and without salaries, meet only semi-annually, and are chosen without the slightest reference to qualifications of knowledge or taste. Another letter-writer is Mr. R. U. Johnson, one of the editors of the magazine, who, while recognizing certain good points in the management of the valley, describes the terrible injuries that have been inflicted upon it, partly through carelessness, partly through greed, but just as often through an ignorant desire to "improve" upon what nature offers. The third correspondent is Judge Lucius P. Deming, of New Haven, Connecticut, who, again, makes a strong plea for the employment of a trained artist to repair what damage already done can still be repaired, and to guide the course of future work. His letter is not the most sensible of the three—all are equal in this respect—but perhaps the most interesting in its relation of the present state of things and its explanation of the aims that should in future be borne in mind.

Notes.

Elwes' Snowdrop is blooming in suburban gardens.

The loss from Fungus diseases in the vineyards of the Hudson River Valley last year has been estimated by careful observers at from fifty to seventy-five per cent. of the entire crop.

In the note on the discovery of a new station for the Nutmeg Hickory (*Hicoria myristicaformis*), on page 24 of the last number, "Southern California" should, of course, read "South Carolina."

A factory has been established at Mannheim, in Germany, for making a substitute for butter from Cocoa-nut oil. About 6,500 pounds of the substance are daily produced and it is said to be palatable as well as wholesome. It sells at a price equivalent to from twelve to fifteen cents a pound.

It is not known when or why the Chrysanthemum was adopted as the crest of the imperial family of Japan, but it is supposed to have been chosen for its hardiness as a symbol of the antiquity of the dynasty. As used on the Emperor's arms the flower appears in single shape with sixteen rays connected by as many little semicircles.

Mr. C. G. Pringle has lately returned from Mexico, having passed the summer in botanical exploration in the Sierra Madre, and the autumn and early winter near Guadalajara, in the state of Jalisco. He is now engaged at his home in Vermont in preparing for the distribution of the summer's harvest of plants, about 18,000 specimens, representing about 350 species.

In reference to the destruction of wild flowers, Professor Bailey, of Brown University, writes that it is not uncommon to see large baskets of *Arethusa bulbosa* for sale on the streets of Providence in May. Water Lilies are peddled all summer. From their habit and situation they are in less danger of extermination, but these rather rare and local Orchids cannot long endure such onslaughts.

Dr. Edward Palmer sailed from San Diego on the 25th of last month for La Paz to continue his explorations of Mexican botany. From La Paz he intends to travel northward and expects to reach the neighborhood of Guaymas in April. Mr. T. S. Brandeggee sailed by the same steamer for the purpose of exploring the lower part of the California peninsula between Magdalena Bay and Cape San Lucas.

A correspondent in Glenellen, Tennessee, sends us the following memorandum with regard to a large Tulip-tree recently cut down near that place. The smallest diameter across the stump, three feet from the ground, was seventy-eight inches inside the bark, which showed 604 layers of annual growth with only thirty-eight layers of sap-wood occupying a width of an inch and a half. The diameter increased three inches in the thirty years, beginning with the five hundred and thirty-sixth year of the tree's age, and six inches in twenty-five years, beginning at a period when the tree was eighteen inches in diameter.

The *Gardeners' Chronicle* has an interesting article on Cornish gardens and the testimony they offer in proof of the mildness of the climate in certain parts of Cornwall. Certainly Falmouth must be a favored spot on the British Isles, when Agaves flower there, and Bamboos, Palms, Tree-ferns and *Dracænas* flourish, and Pelargoniums cover the entire fronts of many houses. We may add that this vegetation is a striking evidence of the difference in climate caused by ocean currents, winds and other influences on opposite shores of the Atlantic. One can hardly imagine Bamboos in Labrador, and yet Falmouth is nearer the North Pole than the southern part of Labrador.

About ten years ago the Austro-Hungarian government planted the sides of a very exposed stretch of railroad, nearly a mile and a half in length, with hedges of the Provence Rose. The hedges have since reached a height of about six and a half feet and a breadth of half as much, for it is a peculiarity of the Provence Rose to interlock its branches and twigs. A living wall has thus been formed which effectively protects the track from snow-drifts, while a neighboring stretch, where the Rose could not be planted, is so deeply buried at every snow fall that it costs much labor to clear it. The first cost was very small and it is believed the hedges will live for thirty or forty years.

Paris will be permanently benefited by the International Exhibition recently closed. The gardens formed on the once naked expanse of the Champs de Mars will remain, and will be extended over spaces covered during the summer by a

multitude of minor structures. The two palaces of the arts will be preserved, and likewise the immense machine gallery, and the latter, it is announced, will be held in readiness for live stock, agricultural and horticultural exhibitions. Under such an unrivaled expanse of glass wonderful shows will doubtless be arranged, especially as a track 300 yards in length and 100 yards in breadth will alternately serve for the exercising of animals and the disposal of flower-beds.

A writer in the *Pacific Rural Press* proposes to use the blossoms of Orange-trees for perfume, and thus realize one more profit from the trees. Every Orange-tree, he argues, has at least ten times as many blossoms yearly as can or ought to bear fruit. At least three-fourths, if not seven-eighths, of the blossoms can be picked off and worked into perfumery without damage to the orange crop. There is a place on the Mediterranean called Grasse, lying near Genoa, where the manufacture of perfumery from orange-blossoms is a specialty—the trees being cultivated for that purpose. Some of the perfumes are exceedingly expensive—one kind of oil made from the orange-blossom, selling at the rate of \$300 per gallon.

At the suggestion of Professor Maynard, of the Massachusetts Agricultural College, Dr. Jabez Fisher, of Fitchburg, girdled one of the two bearing arms of each of sixty Concord Grapevines on the 5th of July last, taking out a ring of bark half an inch long near the trunk of the Vine. As a result the grapes on these arms showed color six days before those on the opposite half. They were fit for market September 20th, or some ten days in advance of the others, and the berries were much larger and sweeter. The gain in earliness makes a great difference in the price of the fruit, and later varieties could be grown when thus treated, which would not ripen if left to themselves. The grapes are larger and more attractive, and this would counterbalance the softness of the berries, a condition which the girdling seems to cause.

Did we go back to farthest antiquity for our holiday customs we should not hang up the Mistletoe until a week after Christmas. When the Druids had carefully cut the parasite from its Oak with golden shears and dropped it into the white cloths held to prevent it from touching the earth, it was distributed to the people on the first day of the new year. Its chief offices were supposed to be the conferring of fertility and of invulnerability to poison. With the advent of Christianity the old reverence for the plant remained in a diluted form. Its use was transferred to Christmas, but it was still hung from the ceiling as it had been in days when a bit that fell to the ground was supposed to portend ill luck. Until that happened it was sacred to the beneficent Freya, but the ground was Loki's empire and Loki was the promoter of all misfortune.

A correspondent sends us a photograph of the great Silver Maple (*Acer saccharinum*) growing on the meadows at Northampton, in Massachusetts, which Emerson mentioned in his "Trees of Massachusetts," page 489. This tree, according to Emerson, in 1837 had a trunk circumference three and a half feet from the ground of twelve and a half feet. Fifty-two years later the trunk girths at the same distance from the ground seventeen feet four inches, an increase of four feet ten inches, equal to an annual average increase in diameter of .355 of an inch. This is remarkable growth, considering the probable great age of the tree, which, judged by the vigor of the branches as shown in the photograph, promises to survive for many years more, although the trunk shows a large cavity extending through it near the ground from one side to the other. Several of the large branches too have been destroyed.

Much has recently been said in these columns about the proper arrangement of trees, shrubs and vines close to country houses. An excellent example of successful treatment may be seen in a colored plate, accompanying the issue of *The American Architect and Building News* for December 28th, which represents a house owned by Mr. Herbert Jaques, at Chestnut Hill, near Boston, and recently built by Messrs. Andrews and Jaques. A group of tall Elms, stands just near enough to the end of the house to shadow without darkening it; and shrubs are grouped beneath the trees and carried well up to it, where they blend with the vines that are beginning to clothe it. Behind a shed at the opposite end of the house rises a smaller Elm, and the front of the shed is masked by gracefully growing shrubs. Except where the gravel curve actually meets the doorway, a space is left for low shrubs and vines. The lawn that fills the foreground of the picture would be improved by the removal of its few isolated shrubs and saplings; but with this exception, house and planting alike are models of their kind.

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The Money Value of Rural Improvements.

ONE of the strongest considerations in favor of preserving the forests in mountain regions like those of New Hampshire is that they offer irresistible inducement to people in the city who are looking for summer resorts. Many people have come to consider a summer residence among the hills as essential to their comfort as a winter home in the city; and the growing practice among those who cannot afford to support more than one establishment of spending some weeks or months away from the confinement of city life makes it a matter of importance that provision should be made for those who find health and pleasure in the woods and amid the scenery of wild nature.

It would be hard to estimate the direct pecuniary advantage which a state like New Hampshire derives from this tide of summer travel which flows toward her mountains all summer long. Every one of these visitors, in some way or other, helps the entire community upon which he depends for a certain time each year for his pleasure and subsistence; and it would not be difficult to prove that the actual and prospective revenue derived from this source is so important that the value of the material products of the forests of the state, even under the wisest management, would be insignificant by comparison.

But it should not be forgotten that there are thousands of people from the cities who, instead of resorting to mountain and forest regions, or to the shores of the ocean, prefer to spend their summers in quiet country villages and farm-houses. Of course it is quite as much to the interest of rural communities to make their neighborhood attractive as it is for the owners of sea-coast and mountain-land. It is true that this should not be considered as the chief reason for efforts to improve the appearance and add to the convenience and comfort of country towns. Societies for rural improvement accomplish a good work when they brighten in any way what is often the dull side of country life. Every attempt to beautify the surroundings of country homes and make them attractive brings its own reward in the happier life of those who inhabit these homes. But apart from this there is a tangible business advantage to be

gained by country villages when they are made specially attractive to city visitors; and this profit accrues not to the villages alone, but to all the surrounding region, when the farm-houses are open to paying occupation, and a market is provided for the products of the farm. It happens in this way that to the population of a large district it is a matter of actual profit to have the neighboring villages and towns made attractive.

The first work in this direction is to improve the roads so that there is some pleasure or at least some comfort in traveling abroad. A visitor who reaches a village over a muddy and rough highway receives no good impression of it, and as the road is also the last thing as well as the first thing which attracts his attention, bad roads are among the most repellant and disagreeable features which any community can present. But where the roads are smooth and hard, with little dust and mud, and where good foot-paths abound, a strong inducement is presented to those who love to pass much time in the open air. Of course this is but one feature of the reform in any community. Shady walks, roadsides clean and bordered with shrubs where this is practicable, farm-yards free from unsightly objects, gardens neatly planted and kept—all these things not only delight the eye as manifestations of beauty and order always do, but they suggest a cleanliness and propriety in all the details of life and a proper regard for health and comfort; they give assurance of good drainage and pure air and all other conditions which make a sojourn in the country desirable and beneficial.

Now, inasmuch as all the inhabitants of a given district are interested in matters of this sort, combined action is naturally suggested. The influence of personal example is undoubtedly great, and many a man, by the proper ordering of his own grounds, has set a pattern which has been followed by his neighbors until an entire community has been regenerated. But after all, these matters can be much more efficiently carried on if it is done in an organized way. Many a town in New England and in the middle states has become prosperous because wealthy men from distant cities have bought lands near by, which have been transformed into beautiful parks, stocked with well-bred cattle and horses. All this was brought about because in the beginning there was unity of purpose in the community to make the town attractive, and transient guests were induced to become permanent residents. Examples like this should be an encouragement to all country neighborhoods and especially to such as have some natural advantages. There will be no abandoned farms in a region where there is associated effort for rural improvement. Such effort cannot fail, in any event, to add to the comforts and pleasures of rural life, and it is more than probable that it will insure a more substantial return in actual revenue than any other equal outlay in whatever direction it is invested.

In every state where there is not already a law to that effect, the friends of the forests should, as soon as possible, secure the passage of an Act restricting the time and method of burning brush. Brush fires are the principal cause of damage to the forests in the eastern and thickly settled parts of the country, and it is hopeless to try to check forest fires unless this evil can be restricted. The notion that a man has a right to do as he pleases on his own land would be well enough, perhaps, if one man owned all the land in the country and were its sole inhabitant. Then his doing as he pleased could injure only his own property. When there are but a few people in a great forest region they are naturally apt to acquire the habit of indifference to the consequences of their actions, because there is often no one to be injured by them or to call them to account. As population increases the habits of careless freedom which were formed in earlier times are still followed, but under the changed conditions they work great and increasing injury.

A man has no right to liberate a destructive force on his

own premises, when it is certain to pass beyond his control, and destroy the property of his neighbors. And yet brush fires are usually set in times of drought, and very often under circumstances which render extensive injury almost certain. Dwellings and other farm buildings, with crops and stock, are often consumed by a fire which was started to burn a little rubbish; and although the burning of a house attracts more attention, it causes far less loss than that which results from the destruction of extensive tracts of forest or woodland. It is impossible for men to live together in civilized society unless they recognize the necessity of submitting to a little control in the interest of the whole community. Necessary restraints and orderly methods are a benefit to all, and as an increasing number comes to be affected by the action of each individual, the sense of personal responsibility should be developed so as to correspond with the more complex conditions of life. The present inconsiderate and lawless method of setting brush fires is a constant menace to the whole community wherever it is practiced. Values to the extent of many millions of dollars are destroyed every year in this country by the fires thus started. Freedom is but one side of life in civilized lands. Order and law are quite as necessary, and they subserve the interests of all. We need in this country a clearer recognition of responsibility for actions which are injurious to others. Want of intention to injure should not excuse carelessness and indifference. Every state should have on its statute books a brief and plain enactment providing for a practical and effective supervision of the matter of firing brush, prescribing the time and conditions for work of this kind, the method by which the law is to be enforced, and the penalties for its violation. Such a law is a matter of great convenience, as well as of economy, in every orderly community, because it enables the citizens to co-operate with each other for their own protection and for the safety of all; and legislation for this object is especially necessary in those states which include considerable areas of forest.

The Decorative Use of Flowers.

IN the decorative use of flowers the two qualities of color and form (or mass) are both to be considered. The first appeals much more strongly to the ordinary sense of beauty and the domestic side of life; but the elegance of certain plant-forms is fully recognized and is instinctively used in the decoration of large interiors, especially of those which have at least a semi-public character. The statuesque growth of the Palm and the delicate arches formed by the spring of tropical Ferns are essentially in harmony with architectural surroundings, and it is a genuine artistic instinct that has, in a manner, dedicated them to the decoration of churches and large halls. Indeed, it is an instinctive sense of fitness which has prescribed the unwritten law that form shall be chiefly depended upon in the decoration of interiors of architectural dignity, and color in the decoration of the home.

Beautiful combinations of color are more generally felt and accomplished than beautiful combinations of form, because the appreciation of form depends upon a much more cultivated intelligence. It is thoroughly understood in Japan. Any thoughtful observer of Japanese art has noticed—especially in the relief decoration of bronzes—that flowers and plants are used absolutely as models, not as mere themes, for decorative designs. Each flower is used singly, at its best and most perfect development of form; and the jar or vase which holds it is selected to carry out the beauty of its lines. This beauty of line which is so effective when applied to ornament is even more effective in nature and can be made to tell with great success in its relation to the decorative grouping of flowers even in the home. Decorative grouping may include the best possible effects of both form and color, and it is for this combination that the true lover of beauty will strive. Anyone with a good memory for color effects, enriched by many a lovely result of accidental grouping—and possessing also that instinct to select among such lessons which we call taste—is well equipped for using flowers for decoration. These memories of successes in time become principles, so that one comes to use contrasts and combinations in flower tints as unerringly and unhesitatingly as a true artist blends or opposes colors upon his canvas.

In the decoration of a room, as a rule, all masses of delicate color should be arranged or placed in strong lights. If for a daylight effect, they should be placed nearest the windows, where no dense shadow will blot out both form and tint. White flowers are best when placed in immediate contrast with a color which reflects, as in this way the white really gets the value of gradation of tint.

Each flower should be able to detach itself from the mass, so as to give shape as well as color. This applies principally to flat masses or banks of flowers which may be most artistically arranged as to color and yet lose immensely in effect if the flower-heads are not allowed to spring, as they would in nature, against some background of foliage or atmosphere.

In all masses or groups of flowers, the best effects of color are made by shading and gradation, using the same variety of flower in different colorings, white warming into rose and rose into carmine, or pale lemon-color deepening into yellow, yellow into orange and orange into sienna or Damascus red, Blues on blues, lilac-purples on blue-purples: these are harmonies with which every flower-lover is familiar, but their effect can be wonderfully intensified by contrasting them with each other, or by different considerations of background and surrounding. A careful leading up of color in the jar or vase which holds the group is of great importance; choosing one which has the same general tone as the flowers but darker, and repeating the color again, but in a lighter tone, in some drapery or other object in the background. To illustrate this, suppose a jar of blood-red Tulips splashed and spotted with red, placed in some shadowy corner of a room, where a brilliant effect is needed. They should stand on a level with the eye, upon a shelf or piece of furniture which is itself dark in color. The jar or vase—which should be rather large in proportion to the mass of flowers—may be of wine-red or liver-colored lustre, or of the red De Morgan lustre showing orange flakes of light from its reflections of the Tulips. The mere added bulk of color is a gain from the decorative point of view, while the repetition of it in a reflecting surface is still another point gained, this glitter giving value to the flesh-like quality of the flowers. If something in drapery, in tones of reddish-ochre or pure yellow, can be drawn in folds behind both jar and flowers, and can fall in long lines below them, the largeness and breadth of effect is still further increased. One can see at a glance how much greater the decorative effect produced by this treatment would be than could possibly be obtained by all these things separately used.

Jars of metal—brass, copper and silver—are universally appropriate to the decorative placing of flowers, and this because of their reflecting quality, which repeats any color massed above them. But the inherent color in metal is more valuable for its contrasts than for its repetitions. Blue flowers in a bowl of burnished brass, with brown-gold draperies behind and beneath them, are a joy forever; and any one who has ever arranged a group of pink Orchids in a classic silver vase, reflecting all their elegance of form and changing beauty of color from the mirror-like breadth of a salver placed below them, will not soon forget the lustrous pearl-like quality of their beauty. Such an arrangement finds its proper environment in a white drawing-room or upon the satiny linen of a dinner-table.

As an illustration of the value of appropriate color and place in the surroundings of flowers, imagine how unlovely this classic vase, with its pink and pearly Orchids, might be if placed against a deep, India-blue curtain, in some dark library or sitting-room. All its delicacy and elegance would be worse than lost—they would count against it as a decorative effect. In such a room one should draw the heavy curtains partly away from the window, and, half against the curtain and half against the light, place a great round brass jar crowded full of bright blue Larkspur, or single Hyacinth, or Canterbury Bell, or any other strong, pure-blue flower. Or one might stand a tall, cloudy-blue porcelain vase against the light, in the middle of the window, fill it with stalks of blue Fleur-de-lis and spiky blue-green leaves, and get an effect like a panel of stained glass.

Solid color is always an advantage in a flower-holder, and few things are more effective than the clay colors—the reds and browns and ochres, and, more than all, the greens one sometimes finds in Spanish and Indian water-jars. All flowers are beautiful in green jars, and it is a pity that they are not more easily procurable, or that they are not attempted in some of our potteries. In fact, large, well shaped and well colored jars, of coarse and cheap clay, are greatly needed in the decorative market. Rich brown, two-handled cooking jars come as near the sort of thing needed as can easily be procured,

and any one who has arranged in them long running branches of yellow and maroon Nasturtiums, or the yellow glory of the Black-eyed Susan, will understand their value.

Endless examples of beautiful arrangements of flowers might be given, and endless rules for such arrangements, but it must be remembered that, to make a house or a room beautiful with flowers, every peculiarity of furnishing, color and light must be taken into account, and that any arrangement, beautiful in itself, may lose all its value from an inharmonious setting.

New York.

Candace Wheeler.

The Nettle Tree.

THE Nettle-tree (*Celtis occidentalis*), known also as the Sugarberry, Hackberry and False Elm, is one of the widely distributed trees of the American forest; indeed, with the exception of the Red Cedar and of the Box Elder, there is no other American tree which grows over such a wide territory or flourishes under such varied climatic conditions. It is very common in some parts of the country, and in others is so rare that to most people its name conveys no idea whatever. In New England, where it is found only in localities remote one from another and never anywhere in large numbers, very few persons know of or can recognize this tree. It is more common on the banks of the Hudson, where it grows quite commonly along the roadsides and by fences, and is sometimes a feature in the landscape; farther west it grows to a larger size and is much more common, and in the forests of the lower Ohio Valley it is one of the largest and most common trees, and is as familiar to the people of that part of the country as it is strange to the inhabitants of New England.

The Nettle-tree belongs to the same family as the Elms. It differs from the Elms, however, in its fruit, which, instead of the membranaceous dry samaras of those trees, is a globular drupe with a thin pulp surrounding a stony seed. The flowers are very much like those of the Elm, except that the male and female organs are generally produced separately, and that the females have one instead of the two ovules of the Elm and that instead of appearing before the unfolding of the leaves they open with them. The flowers, crowned with their two long recurved stigmas, are green and quite inconspicuous, and generally escape the notice of persons who are not looking specially for them. The fruit,* which hangs late into the winter from long slender stems, is as large as a pea and deep orange colored when fully ripe. The dry flesh between the thick outer skin and the stone or seed has an insipid but rather agreeable flavor, and is devoured by many birds.

The Nettle-tree, as might be expected of a plant subject to such varied conditions of soil and climate, varies greatly in different parts of the country, and botanists have at different times believed that it represented several different and distinct species. The reproductive organs, however, are identical in all the various forms the tree assumes, and the differences are differences in habit, and in the leaves, which vary greatly in size, shape and texture. These different forms, however, seen together in large numbers, all pass from one into another, so that it is impossible to find any fixed character of leaf by which it is possible always to distinguish the different forms which have been considered different species. The bark of the trunk in all the forms presents the same general appearance; it is ashy gray, and covered in the case of old individuals with thick discontinuous corky ridges, sometimes an inch deep and half an inch thick.

The Nettle-tree, as it grows in New England, is a low, round-headed tree, fairly well represented in the illustration on page 43, which is the portrait of a tree growing close to the shore on Squantum, a point of land running out from the city of Quincy into Massachusetts Bay. This particular specimen has always grown with sufficient

room for the development of its lateral branches. This, and the fact that it has been exposed to the sweep of the wind, has changed its habit somewhat and shortened and thickened its branches. On the banks of the Hudson the Nettle-tree is an entirely different looking object, with a short, slender trunk, and long, graceful, pendulous branches; west of the Alleghany Mountains, which is the true home of the species, it reaches occasionally, according to Mr. Robert Ridgway, whose paper on the native trees of southern Indiana and Illinois (published in the *Proceedings of the National Museum* for 1882), is one of the most interesting and instructive contributions to American dendrology ever written, a height of 120 to 130 feet, with a tall, slender trunk, 80 feet sometimes to the first branches, and

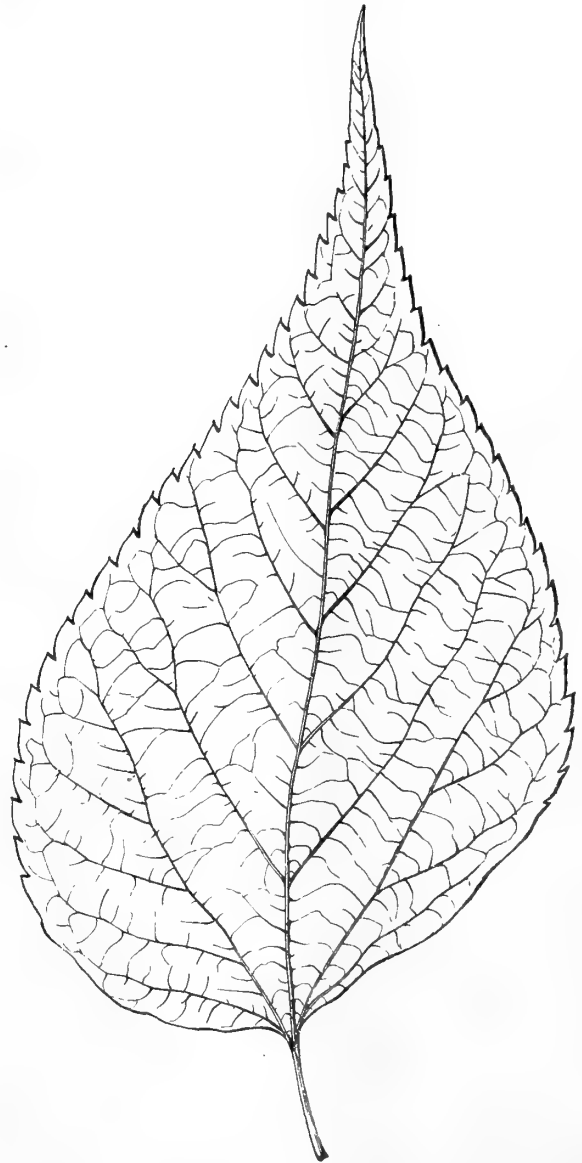


Fig. 7.—*Celtis Occidentalis*: Mississippi Valley.

often comprising three-quarters of the total height of the tree. A little farther west, on the dry Ozark hills of Missouri, it is reduced to a low shrub three or four feet high only, but always with the same flowers and fruit; in the valley of the lower Rio Grande in Texas, and in the mountain valleys of the Sierra Madre in the adjacent parts of Mexico, the Nettle-tree has a short, stout trunk, with a wide head composed of long and exceedingly pendulous branches, the whole forming a tree which no one looking at it from a distance could believe was the species of the Massachusetts coast or of the Indiana forests. Farther west again, in the arid region of western Texas, in Arizona, and in Sonora, it generally has short, stout, upright branches and a totally different habit.

* I.—The fruit may be seen, with the aid of a magnifying glass, hanging on the branches of the tree in the illustration on page 43.

The leaves of the Nettle-tree vary more than its habit of growth under the influence of its climatic environment, although certain characters, especially the arrangement of the veins and the nature of the pubescence which clothes them always in their young state, are common to them all. The trees produced on the fertile soil of the

rather coriaceous leaves with entire margins, very common in the southern States, has been described as *C. integrifolia* (Fig. 9). This form passes, however, into forms with leaves more or less serrate. The leaves of the dwarf form (the *C. pumila* of botanists, Fig. 10) are generally not more than two inches long when fully grown and are often much



Fig. 8.—*Celtis occidentalis*: Massachusetts.—See page 39. 1. Fruiting branch. 2. Flowering branch.

Mississippi Valley have large, membranaceous leaves with deep sharp serratures (Fig. 7, p. 39) quite smooth on the upper surface and only slightly rugose on the lower. This is the form which has been called both *Celtis Mississippiensis* and *C. crassifolia*. On the New England trees the leaves are smaller, and generally narrower, thinner, less coarsely serrate, glabrous or only slightly rugose on the upper surface (Fig. 8). The form with narrowly acuminate, smooth,

smaller; they are generally entire, although sometimes deeply and sharply serrate. The leaves of the Rio Grande form (*C. Berlandieri*, Fig. 11) are acute, with a long, slender point often somewhat falcate and quite glabrous on the two surfaces. The most distinct of all the varieties is that of the arid south-west, the *C. reticulata* of Torrey (Fig. 12). The leaves of this variety are thick, coriaceous, entire, conspicuously venulose, rough on the upper surface, and

Fig. 9.—*Celtis occidentalis*: Entire-leaved form.Fig. 11.—*Celtis occidentalis*: Lower Rio Grande Valley.Fig. 10.—*Celtis occidentalis*: Dwarf form.Fig. 12.—*Celtis occidentalis*: Arizona.

rugose on the lower. This plant taken by itself might well be mistaken for a distinct and well marked species, but it is connected with the entire leaved form of the Mississippi Valley by innumerable intermediate forms which vary in the thickness of their leaves in proportion as the region in which they grow is unequally and insufficiently supplied with moisture.

The range of the American Nettle-tree is from the valley of the St. Lawrence to eastern Oregon, and to Florida, northern Mexico and south-eastern California.

The wood of the Nettle-tree possesses a good deal of

value, and it is destined, as better known woods become scarce or are exterminated, to be used more in the future than it has been in the past. It is strong, not very hard, and easily worked. The color is a pleasing light yellow, but its appearance is injured by the large number of open ducts which mark the layers of annual growth. It has always been used for fuel, as the tree is easily cut and the wood splits well; and of late years it is coming into use in some parts of the west for the manufacture of cheap furniture.

The ornamental value of the Nettle-tree is great; the

habit is good and often exceedingly graceful; the foliage has a bright cheerful green color, and the leaves remain fresh and green on the branches long after those of nearly all our other native trees have fallen. They drop finally without any marked change of color. This tree grows very rapidly; it is free from serious attacks of insects, and it is admirably suited to plant as a street or roadside tree. It will thrive in all sorts of soil and in all exposures, still there are few American trees which have been so seldom planted, or whose beauty or value are so little known or appreciated.

The illustration on page 43 is from a photograph for which we are indebted to Dr. William Herbert Rollins, of Boston. The illustration serves to emphasize what has been said more than once in these columns, that trees in winter possess peculiar beauty, and that to know them well and to appreciate them they must be seen at this season of the year as well as in the summer. C. S. S.

Foreign Correspondence.

London Letter

THE WEATHER PLANT.—About a year ago we were informed by the London papers that Mr. Nowack, of Vienna, had discovered a wonderful property in the leaves of the plant whose seeds are commonly known as "Crab's-eyes," and which is known by the name of *Abrus precatorius*. Like a great many plants belonging to *Leguminosæ*, the leaves of the *Abrus* perform many extraordinary movements under the influence of light, etc. Whatever the cause may be, no one can doubt that the movements of the leaves of this plant, of the Sensitive Plant (*Mimosa*), of the Telegraph Plant (*Desmodium*), of many *Acacias*, *Bauhinias*, and other *Legumes*, have not yet been properly accounted for. Charles Darwin made many experiments and observations on these very movements, and finally concluded that "leaves which sleep continue to move during the whole twenty-four hours." He also demonstrated that there is a continual motion going on, although not generally perceptible, in all plants at all times. The *Abrus* is not the most striking amongst plants whose movements are exceptionally palpable; but Mr. Nowack, after long observation, concluded that in them we possess a "weather indicator" much more trustworthy than any meteorological instrument whatever. He declares that "its sensitiveness to atmospheric and electric influences may be turned to practical account for forecasting the local weather, with truly marvelous precision, forty-eight hours beforehand, and likewise earthquakes or subterranean disturbances, both at a distance and locally, with respectively three to eight days previous notice." An apparatus in which the plants were to be grown was patented by Mr. Nowack, and this, along with his plants, he brought to Kew in July last, with a letter of introduction from H. R. H. the Prince of Wales.

The Directors of Kew naturally afforded every facility to Mr. Nowack in his demonstrations, and Dr. Oliver, one of the best of the younger school of physiological botanists, undertook to watch and check Mr. Nowack's work. The result is about to be published in the *Kew Bulletin*. That the plant is of absolutely no value as a weather indicator is proved by the statistics given in Dr. Oliver's report. Mr. Nowack's prognostications were scarcely ever nearly right, and whatever the cause of the movements it is proved that they are not produced by the weather of the day after to-morrow. Mr. Nowack may plead that weather in England is made up of samples, and no plant, nor yet instrument, however nicely arranged, could foretell weather here. The movements of the leaves of the *Abrus* are influenced by changes in the intensity of light, changes in atmospheric humidity, and changes in temperature. So also are the movements of many other *Leguminous* plants; but why their leaves should move so conspicuously whilst those of other plants under the same conditions show no perceptible movement remains an unsolved problem.

The idea that some plants in their movements foretell the weather is not new. At the end of last century, Ruiz and Pavon describe the movements of *Porlieria hygrometrica*, a Chilean *Zygophyllaceous* plant, not unlike a *Mimosa*. These movements, they say, foretell the weather by closing their leaves in the evening half an hour before sunset if the morrow is to be dry, and an hour before sunset if it is to be overcast and tempestuous. This plant is in cultivation at Kew, and Dr. Oliver has found nothing in its movements to support the above theory.

A GARDENER'S PROBLEM.—Under this title the Director of Kew has communicated to *Gardeners' Chronicle*, a paper on horticulture, which he declares is "essentially an empirical art." This statement the editor of that journal finds fault with on the ground that it is too absolute, and "very discouraging to those who believe that practical horticulture has a right to look to vegetable physiology and anatomy for guidance and profitable suggestion, and, moreover, that it will not look in vain." I need not attempt to reproduce Mr. Dyer's arguments here; but I may say that, however discouraging it may appear, there is no getting away from the fact that horticulture, pure and simple, high-class horticulture, too, obtains practically very little help from the professors of physiology or any other department of botany. An exception might be allowed in favor of those who supply names for garden plants, but the name of a plant is of no assistance in its cultivation, and there are dozens of first class cultivators whose knowledge of nomenclature would be called wofully deficient by the systematic botanist. On the other hand, there are many good gardeners who know a good deal of botany; but they are no better cultivators on that account. I use the term gardener only in the sense of a cultivator of plants. The gardener as an educated man is another question. It would not be difficult to name a dozen men, past and present, who stood, or stand, head and shoulders above their compeers in a knowledge of gardening art, but who never looked for any assistance from the physiologist, and probably never wanted it. The fact is, as Mr. Dyer states, good gardening is the outcome of experiment, and he is the most successful cultivator who is the most thoroughly acquainted with the best methods—*i. e.*, the best results arrived at by experiment on the part of gardeners generally. Take as an example any plant newly introduced, whose cultural requirements are unknown. *Nepenthes Rajah* was introduced by Messrs. Veitch about six years ago. They knew where it came from, and no doubt were well acquainted with the conditions under which it grew when wild.* The plants of *N. Rajah* were distributed, and many were lost through wrong treatment, even by those who grow *Nepenthes* well. It looked as if this grand Pitcher Plant would prove incapable of cultivation, when lo, the information came from Glasnevin, the garden of many important horticultural achievements, that the cool conditions afforded by the Masdevallia, house suited exactly this *Nepenthes*. Physiology would not have been of the slightest avail if called in here, nor would anything have equaled the empirical act of Mr. Moore when he removed a *Nepenthes* from the hottest to the coldest house and watched the result. It often proves the case that some outsider, working in utter ignorance of the conditions provided by Nature for a particular plant, has discovered the best method of culture by accident, some would say, but at any rate, by purely empirical means. Propagation, one of the most important departments of horticulture, neither seeks nor requires assistance from the botanist, and it is questionable if the botanist could help toward the discovery of the most suitable method for the multiplication of any plants. So far as I know he has not done so yet.

Botany, however, explains a great deal of what the gardener does, and in this manner it may be said to help him. The man who understands somewhat the nature of what he is doing is superior to the man who works blindly by rule of thumb. The fact remains, however, that horticulture goes its own way, and by experimenting in all directions discovers the needs of most plants in a manner that often astonishes the botanist. It may be heresy to say so, but the scientific man who knows nothing of horticultural art, is oftener a hindrance than a help to the gardener; and it is not until he has tried to grow plants by the light of his science, and not according to the rules of horticulture, that he discovers with Professor Forster "that there are more things in the plant and in the soil than are dreamt of in the latest philosophy of our newest botany," and the gardener who aims only at fitting the plant and the conditions at his command, so as to make them agree, obtains better results than could be got by the most minute research in the botanical laboratory.

This subject leads one to the consideration of horticultural schools, which are occasionally recommended as affording that kind of training most desirable in a gardener. During the last ten years I have been brought into contact with some

* Mr. Burbidge, who found this plant in Borneo, thus writes of it in his charming book, "The Gardens of the Sun," p. 100: "On open spaces among rocks and sedges the giant *Nepenthes Rajah* began to appear, the plants being of all sizes and in the most luxuriant health and beauty. The soil in which they grew was a stiff yellow loam, surfaced with sandstone grit, and around the larger plants a good deal of rich humus and leaf debris had collected." Still higher up the same mountain Mr. Burbidge found *N. villosa*, and it is remarkable that whilst the latter thrives only in the hottest and moistest stove, *N. Rajah* must be treated as a cool plant. Who would think of attempting to grow *Nepenthes* in a "stiff yellow loam?"



Fig. 13.—*Celtis occidentalis*: Coast of Massachusetts.—See page 39.

hundreds of young gardeners, who have been employed here at Kew, and with scarcely an exception I have found that those men who had been trained in the sciences, in professed horticultural schools, were much inferior as gardeners, *i. e.*, cultivators, to men who had devoted themselves to the study of the art of gardening, and practised it in good gardens. Gardening is instinctive, and a man must love plants for their beauty, not as botanical curiosities or anatomical studies, if he is ever to shine as a gardener. The best gardening school is a good garden, where what is done is done earnestly; and the best gardeners are men who study first the plant as a thing to be grown well, and make it their special business to be con-

stantly on the look out for "wrinkles" which shall help them in their art. As a rule, when a man begins seriously to count stamens and cut sections, he has started on a road that will take him away from gardening, if he is not careful; it may lead him to something that is considered higher than gardening, which, however, is beside the point. *W. Watson.*

London.

[No doubt it is true that scientific study alone will not suffice for the equipment of a practical cultivator; but few persons will deny that it is possible to add with advantage to practical training in the art of gardening some knowledge of the sciences upon which it rests.—Ed.]

Cultural Department.

Grafting.

SOME time ago the London correspondent of GARDEN AND FOREST spoke of the controversy about grafting carried on in *The Garden* and expressed the hope that some American comment would be made on the subject, especially because grafting must have been tested here on a gigantic scale. I had already procured some figures from Mr. C. A. Green, secretary of the American Nurserymen's Association, which I quote: "We have record of five thousand nurseries in the United States, and I estimate that there are five thousand not recorded. Ten thousand nurseries, many of them very small, I estimate, average ten thousand trees yearly, giving one hundred millions of trees propagated annually. For the past fifty years, perhaps twenty millions annually would be within limits, giving a total of a thousand millions in fifty years." These trees have been scattered all over the United States, an area three thousand miles in diameter. Sixty millions of people in America, and perhaps some thousands in Europe, eat annually of their fruit. They were all grafted trees, many of them double-grafted, and so satisfactory has been the process that American nurserymen will continue to graft and American fruit-growers persist in planting them, and yet these trees are what some able writers in the English press stigmatize as "rubbish;" one eminent writer going so far as to assert that "grafting is always a make-shift and often a fraud."

Now I do not care to show how impracticable are the notions of some of these writers who advise a "return to the old plan of hillock layering" instead of this "fraudulent" practice of grafting. I merely wish to state that universal experience has proved that this wholesale condemnation of grafting is baseless. The nurseryman who tries to unite a graft with an unsuitable stock will not succeed, simply because he does not know his business, but when an appropriate stock is chosen for a graft, and both are properly prepared, there is no evidence to show that the tree will not be as long lived and as healthy as a seedling on its own roots.

Mr. Temple, of Cambridge, who was in England while the controversy was at its highest, stated that the sole reason for the use of grafting has been its cheapness. Now if trees can be propagated equally well and more cheaply by grafting than in any other way, that would be an ample justification for the practice. But the fact is that grafting serves many other useful purposes. No doubt the writer of the above is aware that American vines are now largely grown and sold in Europe (see GARDEN AND FOREST, vol. 2, page, 555) as stock upon which the more delicate old-world varieties of grapes are grafted, and that in many regions vine-culture has been saved by this process because the phylloxera does not injure the strong roots of the American vines. It is well known, too, that many ornamental trees do better when grafted than they do on their own stock. *Magnolia glauca* is greatly improved by grafting it on *M. acuminata*, and no one would be so foolish as to layer *M. parviflora* or any other of the new sorts. Mr. Burbidge asserts that he would as soon think of grafting a cabbage as a coniferous tree, and yet he can find thousands of grafted conifers in England which have grown with great vigor and beauty for forty years. In this country seedling Norway Spruces are old and brown and dishevelled in thirty years, while the Oriental Spruce, grafted on this same Norway stock, is in full vigor and beauty.

Mr. Temple states that he has seen acres of grafted Chinese Magnolias with all their buds killed in a hard winter. I have never seen acres of living or dead Magnolias here, but I have seen enough to know that Magnolias properly grafted, planted and cared, for are as sure to grow for twenty years as are Apple trees or Pear trees.

The whole gist of the matter seems to lie in the question whether a perfect union can be formed between a graft and the stock. This is a question in physiological botany which I am not capable of answering scientifically; that is, I have never made, nor am I able to make, the proper microscopic and other investigation which is needed to demonstrate that the union is absolutely perfect; but as a matter of practice I think that no one who has had years of experience will hesitate to say that when trees are properly grafted they show no less vigor than seedling trees and are quite as likely to be long-lived. Of course if one selects for stock and cion plants which are not closely related, or pays no proper attention to the condition of both when the grafting is done, or performs it in a clumsy way, failure will follow. This only proves, however, the lack of skill and intelligence in the operator. If we grant that a union which is practically perfect can be made,

then it seems to me plain that there may be many cases in which grafting would add to the vigor and longevity of a plant, and certainly we may be able to extend the range of certain varieties of fruit and ornamental trees if we can use the roots of one tree which are adapted to a certain kind of soil and graft upon it the top of another whose roots would not thrive in that soil. The grafting of European Grape-vines on American stock is a case in point. Our experience is that roots of *Rhododendron Ponticum* are never killed by heat or by cold here, and, therefore, they make an admirable stock, both for the varieties *R. Cawtawbiense* and the Ghent Azaleas in places where neither of these plants will thrive on their own roots. The best gardeners in England graft the Peach on Plum-stock where fruit is to be grown under glass.

But there is no need of multiplying instances to defend the practice of grafting as an indispensable one in many cases. I have said this much in the hope that other cultivators may give their thoughts and experience, so that some new ideas may be brought forth and suggestions made as to the directions in which the practice may be hopefully extended or in which it may be properly curtailed.

Flushing, L. I.

S. B. Parsons.

The Rose-beetle.

A PUZZLING problem to the horticulturists of southern New Jersey is, "What may be done with the rose-bug?" and the question may become of serious interest generally. This insect, *Macrodactylus subspinosus*, threatens to occupy as prominent a place in our agriculture as does the potato-beetle. It is even more formidable. We know how to deal with the potato-bug, but ingenuity is thus far baffled in devising means of contending against the rose-bug. For some years my own experiences with it have cost a thousand dollars a year, and I am as helpless against this pest as when I began trying to defend my plants from its ravages.

In this region, colonies of rose-bugs have existed in various localities for several years. I first saw a few of them in the corner of my vineyard in 1886. The next year I found there many more of them occupying an extended space. In 1888 they reappeared in multitudes. In 1889 they came in myriads, from the soil of my vineyard, where my colony hibernated, and also migrating to me in swarms, generally from the westward. At the same time this rose-bug irruption seemed prevalent over a wide expanse of territory. Seemingly, in their primary colonies, where we have known these insects for many years, they have been steadily increasing and have at last swarmed forth to "fresh fields and pastures new." There is reason to fear that this swarming may continue. It is a rule of life that, when supplied with food, population tends to increase and occupy new territory. The Colorado beetle staid in its western home until our extending agriculture offered it inducements and facilities for emigration to the east. When it could find food it started on its travels. It is here at home with us, and, while we grow food for it, the potato-bug naturally will enlarge its family and be our thriving guest. For a time there was hope that like some other epidemics this bug-affliction might pass away; but this hope is yearly disappointed. If *Macrodactylus subspinosus* thrives upon our agriculture as does *Doryphora decemlineata* there is work in store for our entomologists. As a foe to viticulture, the rose-bug is more dangerous than all our rots and mildews. Those who have suffered from slight attacks of this insect pest have no conception of what it may be. When they invaded my premises last summer, 1889, they devoured all the fruit on some 4,000 vines in spite of every effort to prevent them. I was not shorthanded, and for several weeks I waged constant war upon them, employing every means of destruction which could be suggested. With me the visitation of the bugs lasted a month, and when they were gone my grapes were gone. The grapes I harvested were from vines which they failed to visit.

The experiments I was making to test preventives of Grape-rot were chiefly a failure, because where the rose-bugs came they left no grapes to rot. Thus, in an isolated block of 450 vines devoted to certain special treatments, and which at the first treatment were full of blossoms, I did not find a cluster left when I went to spray them again. I have a number of vines of specially valued sorts, which I made special efforts to protect. Every morning for three weeks I visited them, before sunrise, and often through the day, knocking off the bugs and killing them on the ground. I thus killed daily hundreds of bugs on every vine. Often when I jarred a vine the ground beneath it would look yellow from their number. It is needless to say that no grape blossoms escaped on these vines.

I have a Sweet Gum tree which is particularly affected by the rose-bugs. At the height of their invasion this tree was occupied by millions of the insects, and at quite a distance from it they could be heard like the humming of a mighty swarm of bees. Looking upward one might see the bugs in the air, drifting like snowflakes from all quarters toward this tree. The ground around it, over the space of a half acre, was yellow with them.

I write these details to give the inexperienced some idea of what an overwhelming visitation may be made by *Macro-dactylus* when he sets forth to get a living. Of the fungus foes to the vine, we have (thanks to the French discovery of the uses of the copper sulphate solutions) henceforth but little to fear. I now am confident of ability to control grape-mildew and grape-rot, but before the rose-bug I am powerless. I have a large vineyard, but if they come next year as they did last summer I have serious doubt of harvesting any grapes.

I have found one mercurial drug which destroys the insect pretty promptly, but it is dangerous to the operator and to the plant. I would hesitate to risk its use, and will not recommend it. Besides, of what avail is it to kill the advancing hordes of this hungry host which pours on in ever-increasing multitude? I think that our protection must be found in some chemical which will be offensive to and thus repel the insect. But I have not found this yet, though I have tried many. In 1887 I fancied that the spraying with copper sulphate solutions was repellant to the bug, and so I reported it. That year they promptly forsook the vines sprayed with Bordeaux mixture. This year they did not, or perhaps the constantly arriving bugs kept up the depredation on the vine. If each took but a mouthful and passed on, it was enough to devour every blossom.

A sure and safe way to kill the insect is to jar them from the plant and kill them on the ground with a paddle. This may be done early in the morning, when the insects seem torpid. After nine o'clock they fly when disturbed, and thus escape damage. Last summer I found a way to overcome this difficulty, and shall resort to it next year with a slight hope of better success. Of good insect powder (pyrethrum or buhach) make a solution, one ounce of the powder to two gallons of water. First wet the powder to a paste before mixing with all the water, and spray the vines with this mixture. The bugs will be paralyzed, fall to the ground and lie helpless for a time. Have men to pass along both sides of the trellis to jar the vines and kill the bugs. The insect powder does not kill them; it only stupefies, and they will finally recover and fly away. But meanwhile they will be still for a while at any time of the day, and thus we may war upon them more destructively, and by constant attention, almost day and night during the rose-bug epidemic, a portion of the fruit, on a limited number of vines, may be saved. The invasion usually lasts about four weeks. As our territory becomes more densely cultivated the parasitic insects and fungi will spread as do infectious diseases through dense populations. In time our viticulture must be greatly modified. To manage large plantations of vines in this way will be impossible, and grape-growers will be limited to as many as they can fully protect.

Vineland, N. J.

A. W. Pearson.

[Colonel Pearson's statement of the problem is accurate, and, from all evidence, the account of injury done is not at all overdrawn. The insect passes the larval state in the ground, feeding on roots of grasses, etc., and is not injurious in that stage. It then resembles a small white grub. In spring the beetles emerge and pair freely. They are especially fond of flowers, and not only those of the Grape, but almost all others attract them, and are injured. The habits of the larva render it next to impossible to reach the insects in that stage, and the imagoes appear in such numbers that, even if all were poisoned one day by a single mouthful, that single mouthful would mean the crop of grapes. A modification of Colonel Pearson's remedy seems the best thing yet proposed. On a light frame of convenient size stretch a piece of muslin so that it shall sag in the middle. Early in the day send a man each side of the trellis with such a frame and jar the beetles from the vines. At intervals dump the collected beetles into a pail of water with a thick scum of kerosene floating on it. Not only from Grapes but from all other favored plants, should the beetles be collected. This is essentially a case where co-operation is necessary, and all interested should unite

and systematically fight these pests, not for one season alone, but year after year, so as to keep them down to harmless limits.

In Germany thousands of bushels of cockchafers are annually collected, and thus only are the trees in many localities saved from complete defoliation. The Government there pays a small bounty, and collecting is compulsory. A common interest here should unite the farmers and lead them to do what there is no legislation to compel. Entomologists may yet find some weak point in the existence of this species; but for the present the suggestions above are all that can be made.—Ed.]

Perennials from Seed.—I.

THERE seems to be some doubt among amateurs as to the feasibility of raising hardy plants from seed, and, judging from advice given in some horticultural papers, it would appear that this, the most natural method of increasing one's stock of perennials, was but indifferently understood. When it is taken into consideration that seed is the medium which Nature has provided, and by means of which nearly all plants naturally spread and perpetuate their species, it only remains to take into consideration the surroundings in which the plants are found, such as climate and position, to enable even the uninitiated to succeed in raising these plants from seed. To American cultivators the one great difficulty encountered at the outset is the means of obtaining good and fresh seed of plants of this description, as there does not appear to be any one yet who has taken up this branch of business and made a specialty of it; for, as a rule, none but the commoner kinds are catalogued, and these are easily and cheaply purchased, while the more rare and expensive kinds are no more difficult to raise from seed, and a good, thrifty plant raised in this way is far more likely to become established than a miffy or minute imported plant. Nothing is more certain, however, than that when the demand comes, the supply will be equal to it.

During the past two months we have sowed over 400 kinds of seed, many of them being seeds of plants which cannot be obtained in any other way. Of those sown about one-fourth have yet to germinate, and this is just about the percentage of perennials which do not come as easily from seed as annuals. With these even it is only a question of time and careful attention in the matter of watering in some cases, while with such as are indigenous to alpine regions, judicious freezing is needed to bring about germination with the advent of spring sunshine. Of those plants whose seeds are usually long in germination, a large number are included among the *Ranunculaceæ*, such as *Trollius*, most of the awned *Anemones* and *Clematis*. In the same list belong species of *Iris*, which have round seeds, *Dictamnus*, *Alströmerias*, most *Liliaceous* plants, and some of the *Fumariaceæ*, as *Corydalis* and *Dicentra*. This rule, covering certain families, is by no means a hard and fast one, as for instance, we sowed seed of the pretty Algerian *Ranunculus bullatus*, and it germinated in a week, while the seeds of *R. Lyallii*, probably the finest of the genus, which we have recently received from New Zealand, may require two years before they appear from the time of sowing. At least this time was required in the only instance of which one can find record where these plants were raised from seed. This is an exceptional case, of course. We name the above kinds as extreme cases, so that there need be no disappointment at delay. The best time to sow seeds of perennials, when it is intended to do so on a large scale, and where a good, light structure and fire heat are at disposal, is, without doubt, as soon as good, fresh seed can be purchased from the growers, or, in other words, any time during the winter or early spring months.

There is a two-fold advantage in sowing as early as possible, in that it not only enables one to devote the necessary attention to the young seedling plants at the proper time and when out-door work is at a standstill, but also that the plants may be strongly established in pots when the time arrives for transferring these to their permanent quarters in the open ground, where many of them will flower the first year, or within twelve months from the time of sowing. We are aware that it is usually thought best to sow seed of all kinds in spring, when increased light and sunshine may be relied on to accelerate growth, and this is so when one has not control over the conditions necessary to ensure germination and a subsequent continuation of growth, as in a well-heated house. Should a hot-bed or cold frame be the only facilities

at command, the success need not necessarily be less, but sowing must be deferred until the departure of frost. On sowing in the open ground we cannot speak favorably, owing to the trying influence of long continued drought and heavy thunder-storms. O.

Passaic, N. J.

Cattleya Dowiana and its Varieties.

THIS superb *Cattleya* is now becoming pretty common in collections, thanks to recent importations; and, as is usual in such cases, it already shows traces of a certain amount of variability in the color of the flowers. It is certainly one of the showiest and most distinct of summer-flowering *Cattleyas*, and will doubtless become still more universally cultivated in the future. The rich crimson-purple lip, exquisitely penciled with radiating golden lines, forms a brilliant contrast with the clear yellow sepals and petals, and imparts a charm to the flower which could scarcely be excelled under any circumstances. It is somewhat curious that so beautiful a species should have remained unknown in gardens so long after its discovery. It was originally detected by Warszewicz, about 1850, in Costa Rica, and both living plants and dried specimens were sent to Messrs. Low & Co., of Clapton. The plants never reached their destination, hence it was that for some years afterward doubts were entertained of the existence of so superb a *Cattleya* as that which the letters of the traveler described. About fifteen years afterward, however, it was re-discovered by Mr. Arce, a native naturalist, who was engaged in collecting natural history objects in Costa Rica for Mr. G. Ure Skinner. Plants were sent to England through Captain Dow (after whom the species was named), and one of them flowered in the establishment of Messrs. James Veitch & Sons, of Chelsea, in the autumn of 1865. It is said to be restricted to a small area on the slopes of the great central mountain range facing the Pacific Ocean, and to exist only in very limited numbers. This is the old typical form, and still rare in gardens; indeed it is said to be more difficult to cultivate than the varieties.

It is highly curious that a form of the same species should grow in New Granada, over 600 miles distant from the native home of the typical *C. Dowiana*. It is the variety *aurea*, and was discovered by Gustav Wallis in 1868, near Frontino, in the state of Antioquia. Rœzl places its habitat near the river Cauca, at a considerable distance above its confluence with the Magdalena. It chiefly differs from the typical form in having the markings on the lip more copious and irregularly distributed over the surface. It is the discovery of this variety which has chiefly helped the plant to become so common in gardens, as the old Costa Rican form is still comparatively rare. It is also said to be more easily cultivated, and certainly seems to be more variable. The variation chiefly resolves itself into a paler or deeper shade of yellow in the sepals and petals, and the relative preponderance of the crimson or golden-yellow markings on the lip. But slight as this may appear on paper, it amounts to a great deal when a number of plants are seen growing together. In some species it would mean the difference between a good and a bad form, though in so grand a species even the worst forms are very beautiful.

The variety *chrysotoxa*, originally called *Cattleya chrysotoxa*, and recently figured at t. 80 of the *Reichenbachia*, is best distinguished by having a large, dark crimson-purple, triangular blotch in front of the lip, which gradually passes into a narrow border of the same color behind, thus leaving a large and very characteristic golden-yellow space on each side of the throat. Other varieties do not appear to have received distinctive names, and perhaps it would be difficult to find constant marks of difference, for they pass so gradually the one into the other that the differences observed may be said to be chiefly that of mere individuals of the same species. The opposite extreme to the one just mentioned is when the crimson color preponderates and the yellow is confined to the radiating nerves. Forms possessing this peculiarity are exceptionally gorgeous, especially when the sepals and petals are of a deeper shade than usual.

The New Granadian form of *Cattleya Dowiana* is known to grow with *Cattleya labiata Warszewiczii* or *C. gigas*, as it is often called, and the result is that several well-marked natural hybrids have appeared in collections in which the characters of the two are unmistakably blended. *Cattleya Hardyana* was the first of these which appeared, and a splendid figure may be seen at t. 231 of the "Orchid Album." *C. Massaiana*, figured at t. 362 of the same work, is equally beautiful, though perhaps less distinct than could be wished, and better called a variety of *C. Hardyana*. In these the characters of *C. gigas* preponderate, especially in the color of the sepals and petals; but in

other specimens, not yet figured, and probably resulting from the reverse cross, exactly the opposite takes place, for the sepals are but lightly marbled with pale rose, while the petals have the ground color of this shade, but the whole copiously veined with light yellow in just the same way as the lip. The effect of this is very curious, though the colors are not as brilliant as in the other forms. Several very beautiful artificial hybrids have also *Cattleya Dowiana* for one parent, and thus we see how important a place it fills in our collections.

London.

Calypso.

Correspondence.

Horticultural Notes From California.

To the Editor of GARDEN AND FOREST:

At this time, January 7th, the San Francisco florists have no out-door Roses. After such a long-continued storm, the only dependence is on plants grown under glass. A few Daffodils and Lilacs are in the market—early flowers from sheltered gardens. The flowers of the Japanese Quince have begun to appear, masses of yellow Acacias are sold on the streets with flowers of *Magnolia grandiflora* from San Raphael, and violets were never more cheap and abundant.

The coming favorite here, among spring-flowering bulbs, is undoubtedly the Daffodil. None are better adapted to California soil and none are more popular. For ten years I have seen the interest in this flower increase, and thousands of bulbs are now being planted. The only Daffodil known here has been the common Yellow Trumpet, but last year collections of English varieties and of other species began to appear, and one occasionally sees a flower of *Narcissus Horsfieldi*, or of *N. praecox pallida*. Naturalized here, among the shrubbery and in hill-gardens, the Daffodil requires no more cultivation than our Eschscholtzias.

A vast amount of Rose-planting is going on in California, and the results will be charming in a few years, as good varieties are mainly used. Several nurserymen have estimated the yearly Rose-sales at 250,000, and of course a great many amateurs propagate plants by the hundred for their own gardens.

The importation of Japanese trees has become a large business here. Four or five firms engage in it. Mrs. Berger has brought over Camellias twelve feet high and in full bloom, and some wonderful collections of Chrysanthemums, Peonies and Lilies. I understand that a large part of the Japanese plants sold in this city are sent to the Atlantic states and the South, or even to Europe, and that few Californians are willing to pay for the choicest things that are imported. This agrees with what some of our older nurserymen have often told me, that the taste for fine plants is at present suffering an eclipse here: The actual number of choice conifers and rare deciduous trees and shrubs that were sold in this state twenty years ago was larger than it is now. The number of beautiful private grounds has not appreciably increased in the region around the Bay of San Francisco, since 1870. Cottage-gardens are more abundant; streets and lanes are more often planted with trees, but that reign of ornamental horticulture, which half a century ago was predicted as certain to come to California, appears little nearer now than a score of years ago. At present hardly a nurseryman in the state keeps the leading Pacific Coast conifers.

"I cannot sell Deodar Cedars, Araucarias, Umbrella Pines, or even our beautiful native Lawson's Cypress," said a prominent nurseryman to me lately.

The trouble appears to be that the enormous growth of the orchard interests, and the capital invested in them, have kept nurserymen and planters alike busy with the practical side of horticulture. Perhaps, after a while, the ornamental department of the nurseries will have a sudden development.

The great rainfalls, floods and heavy snows in the Sierras, have set people thinking about the forests. More than one of the daily newspapers have called public attention to the warning involved. If the snows are to be held back in the mountains, they urge, the trees must be saved. "On the preservation of the forests the prosperity of the greatest interests of the state depends," says the *Daily Bulletin*. It remains to be seen whether this interest can be directed into forms of efficient action.

Charles H. Shinn.

Niles, Cal.

The Citizen's Rights in City Trees.

To the Editor of GARDEN AND FOREST:

Sir.—In your issue of December 18th, Professor Bailey, of Brown University, asks sympathy with his "growl" at the use of sidewalk-trees as telegraph-poles in Providence, R. I. I do not know what sympathy he has received, but I should like

to take the liberty of suggesting that he should not be content with growling if he really cares for the trees.

I presume that the trees in question belong to the city—that is, to the citizens of Providence, subject to the control of the city authorities for the benefit of the citizens. Should the trees happen to be on private property, and free from municipal control, the matter would be simpler. The guilty party is, presumably, a corporation, and even if its officers are deaf to the appeals of reason, they cannot be so to the commands of law. The use of the city's shade trees as telegraph-poles is so manifestly contrary to the interests of the citizens that if Professor Bailey consults a lawyer he may, perhaps, find that he is not without legal remedies after all. To make use of them, however, would require some money, the ultimate co-operation of the authorities, and a sufficient public opinion to sustain the movement.

The latter requisite, if obtained, would bring the others with it, and hence is the first to be secured. If no citizens' association to prevent municipal abuses already exists, Professor Bailey and his sympathizers would have to start the movement themselves. Providence is reputed to be a city of intelligence and wealth (although the only Rhode Island member of the American Forestry Association does happen to reside in Newport), but it is impossible that all the men and women care only for the profits of this telegraph company, and nothing for the trees. Let the tree-lovers organize, secure the co-operation of the local press if possible, appeal to all intelligent men and women (especially the latter), develop public opinion, raise funds for agitation and litigation, and then go before the authorities. If the company has such a "pull" on them that they will not order the wires off the trees, perhaps they may be legally compelled so to order, or the matter may be made a test at the next local election. I believe Rhode Island has adopted the Australian ballot, which facilitates independent nominations, and if so the tree-reformers can run their own men very easily. If Professor Bailey and his friends are too busy to do all this personally, let them get the students in botany to organize for the work. If the students have no enthusiasm for the trees, the lectures they have listened to have been worse than useless. Then there are the students of constitutional history, of political economy and of law. One good object lesson in the ins and outs of local politics, and the acquisition of corporate privileges would be worth months of reading and lectures.

But all this to save a few trees? Well, what did Professor Bailey's growl mean, if not that his rights and privileges had been attacked as well as the trees? Though in this, as in countless other things, that great indictment of popular government holds good, "What is every one's business is no one's business," are not the rights of the citizen always worth defending? Unless Professor Bailey is as ready, to the full extent of his power, to save the trees as the company is to injure them, I fear his growl will be fruitless.

Philadelphia.

Charles C. Binney.

Cor. Sec. American Forestry Association.

The Christmas Rose.

To the Editor of GARDEN AND FOREST:

Sir.—For more than thirty years I have had a Christmas Rose, *Helleborus niger*, in my flower-border, and it always gives me blossoms for Christmas day. This year, owing to the mild season, it blossomed earlier than usual, about the 1st of November, and it is still flowering on the fifteenth of January.

The merits of the plant are: (1) That it gives flowers when other plants are out of bloom; (2) the cut flowers keep fresh in water for nearly a week; (3) it needs no particular care or cultivation. My plant has been in the same place thirty or more years. If we have a very cold night or day I cover it with a box, but I give it no protection at other times.

I write this with the impression that the Christmas Rose is but sparingly cultivated about Boston, and with the hope that others in this region may be led to make trial of a plant which will give them great satisfaction.

Brookline, Mass.

T. E. Francis.

The Mild Winter.

To the Editor of GARDEN AND FOREST:

Sir.—It may be worth while to give a list of plants in bloom in the open ground and in mid-January at Raleigh: Japan Quince, Spiræas of several sorts, Tea and China Roses, Hyacinths, Tulips, Narcissus in variety, Kämpfer's Iris, Petunias, Violets and Pansies, *Bellis perennis*, perennial Candytuft,

Verbenas, Scarlet Geraniums, showing buds on new growth made since November, Strawberries in bloom and fruit, Sweet Alyssum, Drummond's Philox, China Pinks and Carnations, Wallflowers, *Jasminum nudiflorum*, and perhaps other things I have not noticed. Madeira Vines have grown three feet high, and *Lilium candidum* flower-stalks a foot high. A Maréchal Niel Rose clambering over my front porch has at least 500 buds on it, and a large Banksia Rose on a trellis near by is forming buds. Strange to say, none of our Peach-trees have bloomed, but in Anson County, on the South Carolina line, Peaches are as large as nutmegs, and winter Oats and Rye are in full head. Many Peas and early Potatoes have been planted, and change now to freezing weather would be disastrous indeed; yet we can hardly hope to escape altogether.

Agricultural College, Raleigh, N. C.

W. F. Massey.

Periodical Literature.

THE following account of the Spath nursery at Rixdorf, near Berlin, is condensed from a recent issue of the *Gartenflora*. This nursery, which is one of the largest and best equipped in Europe, is remarkable for the new plants it has introduced, especially those from Persia and central Asia. It covers about 600 acres, and is divided into nine departments devoted to different classes of plants, each department being under the control of a head-gardener who shares in the profits of his department. Between 300 and 350 workmen are employed, many of whom have been in the nursery since its establishment, a quarter of a century ago. Their devotion and skill are shown in the fact that, in spite of its great extent, there is not a nursery in the world so absolutely free from weeds. The same care and intelligence are shown in the offices, where an exact and separate record is kept of each department, embracing not only the moneys expended and received, but the plantations made, the development of the plants, and every other detail which can serve to throw light upon the business. It is said that 6,000 species and varieties of trees and shrubs are cultivated, exclusive of about 1,000 kinds of Roses and 600 varieties of fruits; but this estimate is probably an exaggerated one. It is interesting to know that nine of the ten plants sent out from the nursery for the first time this year had been obtained from the Arnold Arboretum. A large number of new varieties have originated in the Spath nursery since its establishment, and among them are several novel forms of American trees, such as *Tilia Americana Moltkei*, and a silver leaved Occidental Plane. Spath's golden-leaved Dogwood is now well known as one of the best plants of its class in cultivation; and several of the best forms of the common garden Lilac originated at Rixdorf.

The following figures give some idea of the extent of the business: Between 500,000 and 600,000 plants are grafted in the course of the year. About 4,000,000 seedlings are grown and 15,000,000 cuttings are struck, besides 75,000 cuttings of conifers; 50,000 conifers are grafted, too, annually. Nearly 2,500,000 ornamental plants are available for the annual sales, beside a quarter of a million standard fruit trees.

All the roads that lead out from the city toward the nursery are planted with interesting avenue-trees, often of uncommon varieties, as, for example, *Populus Bolleana*, *Pterocarya Caucasica*, and Paul's new Scarlet Double Thorn.

What may be called the Dendrological Museum or Arboretum proper is, perhaps, the most attractive part of the nursery to the non-commercial visitor. It is, of course, too small to allow the plants room for free development, but the arrangement in groups, by families, allows ready and satisfactory comparison of the different species and varieties in their young state and greatly facilitates the choice of plants grown in the nursery. The specimens in this special collection are plainly and generally accurately labeled with porcelain labels on which the names are printed in clear, bold-faced letters. There is a collection of standard Apples, and of Pears worked both on Pear and Quince-stock, and one of the long alleys through the nursery is bordered with selected specimens of ornamental trees, containing many with colored foliage.

The soil of the nursery is well suited to the cultivation of Hyacinths, Tulips and Lilies, as the whole area east of Berlin is composed of sand, with a subsoil similar to the famous bulb-growing districts of Holland. A large area is devoted to the cultivation of Lilies-of-the-Valley, principally for the American market. Lilies of many sorts grow in the nursery more vigorously and continuously than in almost any other part of Europe.

Herr Spath comes of a family of gardeners, his ancestors having been well known in the Berlin trade during the last two

centuries. As long ago as 1758 they established themselves on Copinger Strasse, and here there are still the town offices and the city residence of the present proprietor. It is not surprising that, as it is now developed and organized, the Spath nursery should attract many visitors from foreign lands as well as from all parts of Germany, which has no more instructive dendrological collection. It may interest American travelers to know that visitors are always welcomed by Herr Spath, and that the nursery may be reached from Berlin either by carriage or in a steamer to Neuer Krug or Borussia, or by the tramway of the Ring-bahn to Rixdorf, whence an easy half-hour's walk leads to the establishment.

Notes.

Newtown Peppins were sold in London on Holiday week for \$19.60 a barrel.

The well-known Frangipanni essence is made from different species of *Plumeria* (a genus belonging to the Dog-bane family), which grow in the West Indies and certain parts of South America, and especially from *P. rubra*, a native of Jamaica.

The ninth annual meeting of the American Horticultural Society will be held in Austin, Texas, beginning on February 17th, and continuing for five days. An admirable programme has been arranged, and the meeting promises to be one of special interest.

In the greenhouses of Messrs. C. Strauss & Company at Washington, five acres of glass cover 80,000 Rose-bushes, of which 20,000 are of the Wootton variety. All are grown exclusively for cut flowers, and during the season from 10,000 to 25,000 buds are cut each day.

It appears from a note in a recent issue of the *Revue Horticole* that in the three months of July, August and September of last year no less than 1,192 cases, containing 700,000 bulbs were exported from Yokohama to the United States and Europe. A large proportion of these bulbs were, no doubt, *Lilium auratum*, which the Japanese grow as a field crop.

Some days before the close of the year the amount of rainfall for 1889 was announced to have been 58.68 inches, a quantity in excess by 3.34 inches of that recorded for any year since 1871, when the Signal Service Bureau first kept the record. The largest monthly amount fell in November, 9.82 inches; but it is more unusual to find July next on the list, with 9.63 inches.

The way in which foreign plants become "weeds," under new and favorable conditions, is illustrated by the recent case of *Melilotus alba* in our western states. Introduced a few years ago as a garden-plant, it has spread so rapidly in the rich bottom lands along the Missouri River that it is fast driving out the Sunflower and other native weeds. It is commonly called the "Bokhara Clover."

At a large dinner recently given in Washington, a space in the centre of the table nearly forty feet long and eight feet wide was sunk so that the 600 potted Ferns with which it was filled rose but a short distance above the table-cloth. Innumerable little electric lamps were scattered under the Fern fronds; no other lights were used in the room, and the effect is described as particularly charming.

Although the first Chrysanthemum exhibition held in Europe was held in Vienna in 1831, so little attention had recently been bestowed upon the plant in that city that the show organized last autumn was described as a "novelty." About a thousand plants were shown in 1831, belonging to fifty-five different kinds; this year the same number of plants represented 400 varieties. The massing of the plants in a large glass rotunda was described as very effective, but few individuals of great excellence were noted.

A correspondent of the New York *Sun* writes from South Carolina that a new value has been discovered in *Hibiscus esculentus*, the plant which furnishes the vegetable called okra or gumbo. Its stem furnishes a fibre which, like those of Ramie and Jute, can be woven into textile fabrics. Moreover, while in the other cases the fibrous and the woody elements are mixed together in the stem and have to be separated by hand, in *Hibiscus* the fibres form a central core surrounded

by the wood. They may, therefore, be separated by machinery and, being long and extremely strong, will furnish an excellent fabric at very small cost.

So many reminders of the mild winter have been received at this office that we have no space to notice all of them. Very interesting was a photograph of a group of Christmas Roses which came from Cazenovia, New York, to testify how beautiful these flowers can be in mid-winter. We have received branches of many shrubs with fully-expanded flowers, and in a collection of this sort from the Meehan Nurseries at Germantown, together with many which we have heretofore noticed, were sprays of the Cornelian Cherry with the yellow stamens showing through the opening buds, and the Tartarian Honeysuckle with buds just opening.

The November number of *Macmillan's Magazine* contained an article by Mrs. Lecky on the "Gardens of Pompeii," which may be of interest to our readers as drawing at greater length upon the authorities quoted in the description of Roman gardens that was published not long ago in our "History of the Art of Gardening." The influence of the East on ancient European gardening is especially emphasized, and it is asserted on good authority that most of the gardeners of the Romans were Orientals. "At the very time when Roman power and luxury were in the ascendant, Italy was overrun with Semitic slaves. . . . Their gentleness and patience, their peaceful, laborious tastes, while rendering them unfit to be soldiers and gladiators, eminently qualified them for domestic service, and especially for the care required in tending plants."

The grass known as "Lalang" (*Imperata cylindrica*) gives the foresters of the Malay Peninsula more trouble than our own prairie grasses give the tree planters of the west. This Lalang is injurious by reason of its inflammability and because it prevents any cultivation of the land covered by it, except at great expense. Wherever land is allowed to run to waste it is soon covered with this grass except where the soil is wet, or sandy, or shaded by trees. The annual report of the Conservator of Forests at Singapore refers at great length to this plant, stating that it can be exterminated by chemicals, but these are expensive and have an injurious effect upon the trees planted in forest upon the land afterward. When trees are large enough to throw a shade the Lalang quickly disappears, and it cannot penetrate into forest glades if but a few trees bar its progress. The gradual planting of bushes and shade trees is recommended as the surest remedy for this grass pest.

The death of Peter Henderson removes a conspicuous figure from American horticulture. At the great establishment on Jersey City Heights, which he founded, the plants raised and sold every year exceeded in number those produced at any nursery in the world. His business as a seedsman was among the most extensive in the country. He was the author of many popular books, one of them, "Gardening for Profit," having attained a circulation of 150,000 copies. Every year, 200,000 of his illustrated catalogues were sent throughout the length and breadth of the country. He was a frequent contributor to many journals devoted to agriculture and horticulture, and a prominent place was always accorded to him at the meetings of the Association of American Florists, and of kindred societies, as well as in the business councils of his associates in the trade. Altogether he was more widely and familiarly known than any other man in connection with the horticulture of the country. And few men have exerted so marked an influence in his chosen field of activity. To him more than to any other one are we indebted for many improved processes in the production and distribution of plants. He not only aided in this direction by his writings but he exemplified his counsel in action, and a visit to his establishment was an object-lesson to all who wished to learn how horticultural practice could be made more cheap, simple and effective. Every square of glass and every foot of ground was always occupied to the full limit of its productive capacity, and every man was accomplishing all that was possible by trained skill and thorough organization. Mr. Henderson's alertness, enterprise and success as a business man was known to all the world, but only to those who were admitted to a closer intimacy was the genuine worth of his character fully revealed. His integrity was beyond any shadow of suspicion, his public spirit was universally recognized, his robust manliness and force were admired by all who came in contact with him, but the considerate kindness of his disposition will bring more tender memories to many a man who has received from him prompt and generous assistance at precisely the time when sympathy and help were needed.

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Legislation for the Adirondacks.

FOUR bills prepared by the New York Forest Commission have been introduced in the Legislature.

The first authorizes the purchase of lands located within such counties as include the Forest Preserve. This provides that the Forest Commission, with the approval and concurrence of the Commissioners of the Land Office, may purchase lands in these counties at a price not to exceed one dollar and fifty cents per acre, and that no purchase of lands shall be made in excess of previous appropriations for that purpose.

The second amends the law regarding the formation and regulation of railroad corporations, so that Section 25 shall read as follows :

The Commissioners of the Land Office shall have power to grant to any railroad company formed under this Act any land belonging to the people of this State which may be required for the purposes of their road, on such terms as may be agreed on by them; or such company may acquire title thereto by appraisal, as in the case of lands owned by individuals; and if any land belonging to a county or town is required by any company for the purposes of the road, the county or town officers having the charge of such land may grant such land to such company for such compensation as may be agreed upon. The land included in the State Reservation at Niagara, and the Concourse land on Coney Island, and such lands as are included in the Forest Preserve, and that now are or that hereafter may be placed in the care, custody and control of the State Forest Commission, are expressly exempted from the provisions of this Section.

The third provides for a change of venue by amending the Code of Civil Procedure in certain cases; and the fourth amends the Act establishing the Forest Commission, so that Section 20 of Chapter 283 shall read as follows :

Every supervisor of a town in this State, excepting within the counties mentioned in Section 7 of this Act, shall be *ex officio* fire-warden therein. But in towns particularly exposed to damages from forest-fires the supervisor may divide the same into two or more districts, bounded as far as may be by roads, streams of water, or dividing ridges of land or lot lines, and he may, in writing, appoint one resident citizen in each district as district fire-warden therein. A description of these districts, and the names of the district fire-wardens

thus appointed shall be recorded in the office of the Town Clerk. The supervisor may also cause a map of the fire districts of his town to be posted in some public place, with the names of the district fire-wardens appointed. The cost of such map, not exceeding five dollars, shall be made a town charge, and the services of the fire-wardens shall also be deemed a town charge, and shall not exceed the sum of two dollars per day for the time actually occupied in the performance of their duties as such fire-wardens. The services of the persons who may assist in extinguishing a forest-fire shall also be a town charge, and shall not exceed the sum of one dollar per day for each person employed; but all bills for such services must be approved by the fire-warden of the town in which the fire occurred, before payment shall be made. It shall be the duty of the Board of Auditors in each town to promptly examine, audit and allow all reasonable bills presented to them by fire-wardens for services and disbursements under this Act, and for the payment of persons assisting in extinguishing forest-fires. Within the counties mentioned in Section 7 of this Act, such persons shall be fire-wardens as may from time to time be appointed by the Forest Commission. The persons so appointed shall act during the pleasure and under the direction of the Forest Commission. Upon the discovery of a forest-fire, it shall be the duty of the fire-warden of the district, town or county to take such measures as may be necessary for its extinction. For this purpose he shall have authority to call upon any person in the territory in which he acts for assistance, and any person shall be liable to a fine of not less than five nor more than twenty dollars for refusing to act when so called upon.

The most important of these measures is the one providing for the purchase of lands for the forest preserve. If the State is to own any land at all, it should gradually acquire title to the tracts lying between the blocks of land now held by the state. It should make a beginning with a small appropriation, and while wisely caring for what is already in its possession, should purchase such lands as can be cheaply acquired, and which are so situated that their acquisition would lessen the danger from forest-fires, and render the guardianship of the state lands more convenient and effective. It is most desirable that all the people of New York should come to have a more vital sense of proprietorship and responsibility regarding the property of the state in the Adirondack region, and an appropriation for the purchase of additional land would doubtless tend to produce this effect. All observers of the mountain forest-regions of the state unite in testifying that whatever the disposition or wishes of a railroad company may be, the extension of the road through new portions of the wilderness is usually followed by the denudation and ruin of large tracts of valuable forest-land. As the timber becomes accessible it is cut off without regard for the future, and much of the land is burned over so that forest-conditions are permanently destroyed. To prevent the farther extension of railroads over state lands would save more of the forests which still remain on these lands than any other measure that can be devised.

The bill providing for a change of venue in suits for trespass on state lands is necessary to an effective administration of the laws. Such cases cannot always be fairly tried in the vicinage where the depredations were committed. The apprehension has been expressed that some provisions of the Fire Warden Act might induce public-spirited citizens to rally for the extinguishment of fires in such numbers as to place a serious burden upon taxpayers, but some risk must be taken to secure the maximum of efficiency. On the whole the proposed legislation seems wise, and the bills should command the support of the press and the people of the state.

One of the most interesting botanical results certainly, obtained by Dr. Henry during his residence in western China, is the establishment of the fact that the Tulip-tree is an inhabitant also of that country. That monotypic species occur in eastern America and in eastern Asia is no new fact, but the plants common to the two regions discovered up to this time have been unimportant herbs, and the Tulip-tree is the first instance recorded of a

tree found in them both; and a tree, in spite of the long period of its cycle of existence, would be expected, from its greater exposure to climatic changes, to undergo greater modifications than a smaller plant. The presence of the same tree in Asia and in America is remarkable, perhaps, but it is not remarkable that Tulip-trees should grow in these two remote regions. It would be remarkable if one was not found in Asia in view of the similarity of the two floras, and of the fact that Tulip-trees of many species were at one time in the world's history widely distributed over its surface. The chief significance at this time, therefore, of Dr. Henry's discovery is that the climatic conditions of eastern North America and central China are so nearly identical that the descendants of a common tertiary ancestor—one in America, the other in China—have not become sufficiently altered during all the centuries they have existed to furnish to the eye of the systematic botanist differences sufficiently marked to enable him to separate them specifically. But we will refer our readers to the following account of the Chinese Tulip-tree, contributed to the columns of the *Gardeners' Chronicle* by Mr. W. Botting Hemsley, the author of the exceedingly valuable catalogue of Chinese plants now being published in the *Journal of the Linnean Society*:

It is just thirty years ago that the late Dr. Asa Gray published his memorable essay on the close degree of relationship between the floras of Japan and eastern North America respectively, as compared with the relationships between the floras of eastern North America and Europe, and between those of western North America and eastern Asia. I allude now to the vegetation of the temperate zone as distinguished from that of the arctic zone, in which there is a greater continuity of land and a much more uniform flora. The results of Gray's investigations showed that a considerably higher percentage of allied species inhabit Japan and eastern North America than inhabit western North America and Japan, or Europe and Japan. The number of identical species known at that date to be native both of Europe and Japan was rather greater than the number of identical species in eastern North America and Japan, but these consisted largely of species ranging from western Europe to eastern Asia.

The late Professor Miquel sought to minimize the importance of Dr. Gray's deductions, on the ground that many of the assumed identical species were different; but, whichever way we view it, there is no disputing the fact of the existence of numerous genera in the floras of both eastern North America and eastern Asia (China and Japan) that are not represented in the present flora of Europe, though there is evidence that some of these genera, at least, formed part of the pre-glacial vegetation of Europe.

Since the appearance of Gray's essay the flora of Japan has been more exhaustively investigated, and the immense botanical collections made in central China by Dr. Augustine Henry and others have revealed the existence of many other connecting links between the temperate floras of eastern Asia and eastern North America.

Among these discoveries none is of greater interest than the Chinese Tulip-tree. Almost everybody in England who is fond of trees is familiar with the North American Tulip-tree, which has no counterpart in its curiously truncated leaves among the trees hardy in Britain. Indeed, this type of foliage is not very closely imitated in any other genus of plants throughout the world; most nearly, perhaps, in some species of *Passiflora*.

In 1875 Dr. Shearer sent leaves of a Tulip-tree from China to Kew, collected on the mountains near Kiukiang, in the province of Kiangsi, in about the latitude of Ningpo, but between five and six degrees westward. Mr. Le Marchant Moore published an account (*Journal of Botany*, 1875, p. 225) of Dr. Shearer's collection of Chinese plants in which these leaves were found, and we learn therefrom that Dr. Shearer regarded it as a native of the region where he collected it.

In 1878 Messrs. Veitch, of Chelsea, presented to the Kew Herbarium a collection of dried Chinese plants made for them by Mr. Maries. This collection contained one small specimen of the Chinese Tulip-tree. It is quite young, neither the leaves nor the flowers being fully developed. Mr. Maries collected it near Kiukiang, from a tree growing near a temple; and in a note accompanying the specimen, he states that it was a fine spreading tree with green flowers, but he regarded it as inferior to the American. With regard to the color of the flowers, that was probably due to their very young state, and

the same may be said concerning their small size. Still the material was insufficient to decide whether it was specifically different from the American, and I accordingly published it as a doubtful variety under the name of Chinese in the *Index Floræ Sinensis* (*Four. Linn. Soc.*, xxiii., p. 25).

Early in the present year Dr. Henry sent to Kew copious completely developed specimens, confirming the view that it is the same species as the American, and not distinguishable, even as a variety. Judging from the specimens, the Chinese Tulip-tree presents exactly the same kind of variation as the American; the foliage of young or vigorous trees being much larger and more deeply lobed. Dr. Henry collected specimens on the mountains both north and south of the River Yangtze, in the province of Hupeh. At Paokang he found it forming a spreading shrub, six feet high, at an elevation of 6,000 feet. At Chienshih he collected flowering specimens from a tree thirty feet high, and leaves from a young tree in the same locality are a foot across in either direction. It bears a Chinese name signifying goose-foot-leaved Catalpa. The localities where Dr. Henry collected the Tulip-tree are between 300 and 400 miles westward of Kiukiang, a region previously all but unknown, botanically, beyond the banks of the Yangtze River.

French Parterres.

THE Luxembourg palace, one of the finest and most famous buildings in Paris, was begun by Marie de Medici in 1615, her architect being Jacques de Brosse. A smaller palace, razed to make room for it, had been owned for a time by the Duke of Piney-Luxembourg, and hence the name of the existing building. For many years during the present century it contained the State collections of modern art; but these have been removed to a new museum in the gardens near by, and the palace is now the Senate House. Our present object, however, is not to describe the palace itself or the large and beautiful gardens which surround it, but simply to call attention to the method of planting shown in the foreground of our picture (see page 55).

We spoke not long ago (vol. ii., p. 590) of the bad taste displayed in many French parks where bright, formal flower-beds and isolated tropical plants are profusely scattered about, with no regard to the main lines of the design or to the general effect which these were intended to produce. But such mistakes, frequent though they are, should not be taken as representative of the current level of gardening-art in France. Especially where the design is itself formal or semi-formal in character, the most perfect good taste and a keen feeling for harmonies of line and color are constantly revealed; and strangely enough, it may seem, the treatment is then apt to be less strictly formal and mechanical than in the essays of other nations.

The chief features in many of the small parks of Paris, and in those parts of larger grounds where there is close contact with architectural forms, are straight narrow paths and rectangular grass-plots, kept free from all scattered plants or beds, but encircled by long beds planted with a great variety of hardy flowers and shrubs. Such are the small spaces which surround three sides of the Louvre at the end where it faces the church of St. Germain, and many parts of the gardens attached to the royal suburban palaces as well as to the Luxembourg. The chief point with regard to the arrangement of the flower-beds is that, while symmetrical, it is not formal, either as regards the selection and arrangement of the plants or the method of their cultivation. Shrubby perennials—standard Roses, dwarf and low Standard Althæas and Persian or Chinese Lilacs being the favorites—are set at regular intervals along the centre of the bed, its ends being commonly marked by rather taller specimens. Between these, conspicuous annuals are set, and then the bed is filled to its edge with a varied mass of more lowly-growing flowers. In August and September there might be noted among the taller annuals Dahlias of different heights, Gladioli, Cannas, Asters and Bush-Daisies; and, among the others, Geraniums, Tuberous Begonias, Lobelias and Lantanas, with Centaurea, Coreopsis and *Gaura Lindheimeri*. These last were not mingled heterogeneously as isolated specimens, and neither were they clipped and restrained to make formal patterns. A little clump of each was carefully placed with due regard to the habit and the color of its neighbors, and then the whole mass allowed to grow in free luxuriance. Particularly pretty effects were produced by mingling red with white Geraniums, or by contrasting the red ones with a clump of white Centaurea; and, again, by allowing a pale Heliotrope and a yellow Lantana to interlock their

sprays. The blue Lobelias were carefully distributed so that they did not offend the eye by contrast with inharmonious hues; and, in general, excellent use was made of all the white flowers to separate and relieve those of vivid colors. In certain other French towns the grass-plots sometimes showed a central bed of flowers or foliage-plants, while shrubs were set near their angles; but no such instances were noticed in Paris, and the effect is far better when the grass furnishes a perfectly quiet background for its brilliant border.

Of course the spring and early summer aspect of such a border is different from the one we have described; but it must be equally charming, especially as then most of the standard shrubs would be in bloom. From the artistic point of view these beds are infinitely better than the flat pattern border; they are less mechanical in themselves, and, so to say, furnish a distant view more effectively, and they give the chance to use a great variety of beautiful flowers instead of only a few sorts combined with showy foliage-plants. From the practical point of view their superiority is as manifest. The standards, of course, are permanent; there is much less cost for wintering the other material, and much less labor in its arrangement and its subsequent care. After the summer planting has been done no care, indeed, is needed but watering and the occasional clipping of a plant which has run out too far over the grass. No one could question the beauty of the system who saw it last summer where it was most extensively and beautifully used—in the new gardens which occupy the former site of the Tuileries and connect the courtyard of the Louvre with the old Tuileries garden. Here acres were laid out with straight walks, grass-plots and long flower-beds, the lines being sufficiently varied to prevent monotony; and even when a large flower-bed stood by itself at the intersection of paths, it was arranged in a manner similar to that shown in the borders. The free beauty of the many flowers was enchanting as one passed by the successive beds; and the effect of the whole was harmonious yet brilliant in the extreme, and admirably adapted to the neighborhood of the stately buildings. In this case, and, indeed, in most others, the beds are not protected by the railing which in the Luxembourg garden somewhat injures their effect, but are merely divided from the walk by a narrow strip of grass, or at times by two such strips with a line of gravel between them.

Such borders are called by the gardener "French parterres," but it will be a pity if their use is long limited to France. Of course they too would be inappropriate as features in a natural landscape-design, but we often employ designs of this sort when formal arrangements would be better; and in these cases the graceful and varied symmetry of the French parterre strikes the happy medium between over-freedom and over-rigidity. With the great number of hardy flowers and shrubs at our disposal it ought to be easy—if, indeed, we possess an equal feeling for color harmonies—to exceed even the beauty of recent Parisian essays.

Californian Palms.

THE most remarkable arboreal feature of the deserts of southern California is the Washingtonia. It is as pre-eminent in its arid home as the Sequoia is in the forests of the Sierra, which it further resembles in growing only in a limited area. Perhaps the comparison may be carried further, for as the "Big Trees" now living are but the lingering giants of a vanished forest, so it is probable that these Palms are the scattered descendants of a more abundant race that once occupied the borders of the arm of the Californian Gulf which filled formerly the bed of the desert they now inhabit. We find them further north and west, at Whitewater, at an altitude of 1,126 feet. Thence the desert, broadening into a wide valley, falls rapidly, till at Indio, only seven miles away, it is twenty feet below the sea level, and at Frink's Spring, twenty miles further east, it is 260 feet below. In this depression the lingering waters formed a salt lake so recently that the record of its slowly receding levels is still visible in the discolorations of the cliffs which in places once formed its shore. It is along the hills which border the bed of this extinct sea that the most extensive Palm-groves are found, while scattering trees mark the direction of the channel which once led to the gulf.

These considerations may explain the anomaly presented by this Palm of being the only arborescent species in the United States which grows at any great distance from the sea.* Its station at Whitewater is the northern limit of Palm growth on the western side of the American continent, more than a degree further south than is reached by the *Sabal Palmetto* on the eastern coast.

*In Lower California, where it is found, Washingtonia is also a littoral species.

The Southern Pacific Railway runs through the desert I have mentioned, and between Indio and Seven-Palms stations some large groves of Washingtonias can be seen at the bases of the hills, a few miles to the north. A surface overlaying water, brown with alkali, produces here strips of damp soil, whitened with saline incrustations, which coat even the stems of the salt grass (*Distichlis maritima*) which spreads a sod of dingy green, grateful amid the surrounding bareness. Here the Desert Palm finds a congenial soil, for it is an oasis plant, and requires moisture for its roots. Though the most accessible, these are not the most satisfactory groves to visit. The number of really fine specimens here is not great, and most are badly damaged by fire. Their open situation exposes them to the full force of the desert siroccos, so that they have a gaunt and worn look, as if the struggle for existence had been hard. A smaller but much finer group is to be found in a sheltered cañon of the San Jacinto Mountains, some ten miles south of Seven-Palms station. Following a short distance the slender stream of clear water that runs through the narrow bed of this cañon, a more open place is reached, floored with wet sand in which lie half buried great angular fragments of granite. Here are growing a hundred Palms, mostly in the sand, but a few on the steep hillsides. There are some noble trees here, and the whole grove has an aspect of thrift.

Dr. Parry tells us* that the Desert Palm was discovered by the botanists of the Mexican Boundary Survey, who supposed it to be the Palmetto of the Atlantic coast. However, no mention is made of it in the report, and its first appearance in botanical literature is in the Smithsonian Report for 1860, where Cooper refers it doubtfully to *Brahea dulcis*, Mart. Then Herr Wendland, the distinguished Palmographer of Hanover, placed it in *Prichardia*, as *P. filamentosa*. Later, erecting for it a new genus, he called it *Washingtonia filifera*, fittingly reviving for the generic name one formerly bestowed on the Sequoia, but which the law of priority did not permit that genus to stand. The change in the specific name was less happy, as the strict construction of the recent reformers of nomenclature will demand that it be changed to *filamentosa*. Somewhere it has also picked up the name of *Brahea filifera*, by which it is usually known in horticulture. Its common names in California are Desert Palm, Fan Palm, or sometimes San Diego Palm, from its growing wild, in the United States, only in that county, and not in San Bernardino, as is usually stated in botanical works.

Seventy-five feet is probably the greatest height reached by the Desert Palm. The top is crowned by a cluster of light green leaves, whose stout stems, deeply channeled and beset along the edges with hooked spines, are eight feet, or more, in length. The plaited blades are some four feet in diameter, gladiately cleft at the edges, which are abundantly furnished with long, thread-like filaments. The leaves gradually turn down with age, until at last, layer over layer, they surround the trunk with a dry thatch, which descends in a regular cone from the verdant crown to the ground. This makes an admirable natural protection to the trunk from the scorching heat and drying winds of the desert. Unfortunately most trees have been deprived of this mantle. Its inflammable material is easily kindled by an accidental fire, and is an almost irresistible temptation to the passing vandal; but the most destruction is attributed to the desert Indians, who are said to burn the dry leaves that they may more easily gather the fruit. That any plants survive this ordeal of flame is strong evidence of the vitality of the species. No endogen could live through such a martyrdom. But of all the Palms of a fruiting size growing in the Colorado Desert very few have escaped it. I remember seeing only one tree, and that not over twenty feet high, with its protecting thatch uninjured. Naturally it would persist certainly many years. On cultivated trees, where the dead leaves are kept cut off close to the trunk, their fibrous bosses adhere so long that not more than four feet at the base will be free from them in a twenty-year-old tree. The bark is then seen to be gray, with close transverse fissures. The wood is fibro-vascular, with a specific gravity of .51.

A mature tree produces in June three or four large panicles of small scorious flowers. The stout terete peduncle ascends from the axil of a leaf near the centre of the crown, and is of the length of the petioles, so that the ultimate divisions droop over the blades. Gradually the peduncle declines, till, in September or October, the ripe fruit hangs pendent over the mass of dead leaves. Each cluster produces some ten pounds of fruit, the size of a large pea, with a thin, sweetish pulp and a bony seed.

The Desert Palm was early planted at the old Spanish mis-

*San Francisco Bulletin, March, 1881.

sions, and some fine specimens still remain. One of the best is in the grounds of Mr. T. H. Ramirez, in Los Angeles, and is now fifty years old. A careful estimate of the height, made recently by the Rev. J. C. Nevin, is as follows: Height of living leaves, 14 feet; mass of dead leaves,* 10 feet; trunk, 34 feet; total height, 58 feet; circumference three feet from ground, 10 feet 10 $\frac{3}{4}$ inches.

The same tree was measured in 1880 by Dr. Engelmann, who estimated the height as substantially the same, and found the circumference to be only four inches less.

A tree growing on Second Street in San Bernardino, twenty-two years from the seed, measures: To the leaves, 22 feet; roof crown, 10 feet; total height, 32 feet; circumference three feet from ground, 9 feet 2 inches. This tree has produced flowers and fruit for the first time the present year. During the last few years many thousands of these Palms have been planted in southern California, which in time will become notable features in the landscape.

So far as is actually known, the Palm already described is the only one indigenous in California, or, indeed, anywhere in the United States west of the Atlantic and Gulf coast-regions. There are, however, some indications that other species may be waiting discovery. Two species of *Erythraea* are near our borders. *E. edulis*, Wats., inhabits the island of Guadalupe, off the coast of Lower California, while *E. armata*, Wats., comes within thirty miles of the boundary on the Mexican side, and may be found in some yet unexplored cañon on the American side.

Ten years ago Mr. W. G. Wright obtained from the desert Indians a few Palm-seed of two different kinds, which appear to belong to no known species. They were represented to have been procured in the neighboring desert, but the most zealous efforts failed to lead to the discovery of the trees. There is some reason to think that they may have been brought from Mexican territory.

Washingtonia robusta, described by Wendland in 1883, is also supposed to be Californian, but its origin and character are alike doubtful. It was founded on some young plants raised in a Dutch nursery, the seeds of which were supposed by the proposer of the species to have come from the "Valley of the Sacramento River, in California"—an obvious error. Again, "M. Roezel is said" (by E. André in the *Revue Horticole*) "to have gathered the fresh seed in Arizona." It is quite certain that no botanist is known to have seen an indigenous tree. Seed-collectors, however, are more fortunate, and are able to supply abundantly the market with *W. robusta* seed, which has no apparent difference from that of the common Desert Palm, except its higher price. The published characters of the proposed species show no important points of difference from the better known one, and, indeed, are hardly sufficient for more than a garden variety. May not the seed from which the original plants were raised have been gathered from a *W. filifera* having individual peculiarities that impressed upon its progeny the minor characteristics by which they seem to differ from the ordinary form? Greater variations are procured by seed selection by cultivators, and among plants growing wild, marked individual differences are not uncommon. At best, this species is a very obscure one, and it is to be hoped that more light may be thrown upon its true character.

San Bernardino, Cal.

G. B. Parish.

New or Little Known Plants.

Kalanchoe carnea.

THIS South American plant,† of which a figure appears on page 53, although it has suffered, perhaps, like most horticultural novelties, from over-praise, seems really an important and valuable addition to winter-blooming plants.

Like the *Crassulas*, to which *Kalanchoe* is very closely related, *K. carnea* is a very easy plant to manage. The seeds sown in the early spring will produce plants which will flower at Christmas-time. The seedlings may be potted during the summer or may be planted in the open ground and lifted and potted at the appearance of frost. The temperature of a warm greenhouse, in which the plants should get the benefit of as much sun as possible, will bring them into flower by the middle of December, or

*All the dead leaves were cut away two years ago, and these have accumulated since.

† *Gardeners' Chronicle*, ser. 3, i., 211, f. 48, February 12th, 1887.

they may be retarded in a cooler temperature. The habit of this plant is fairly good, but it can be improved by pinching the end of the main stem early in the season, which will then throw up three or four flowering branches. *Kalanchoe carnea* flowers freely, and the flowers, which are pale pink, are so fragrant that a single cluster will perfume a whole house. Its blooming at a time of year when flowers are more scarce and more in demand than at any other season of the year makes it a desirable plant; and the fact that it can be treated as an annual or can be propagated from small cuttings adds to its value; as the plants can be thrown away as soon as they are out of flower—an advantage which will be appreciated by persons with small greenhouses in which space cannot well be spared for plants that have passed their productive state early in the winter.

Kalanchoe carnea is so easily raised and flowers so freely that it is suggested that it may prove one of the best flowering plants for cultivation in rooms which has been introduced for some time.

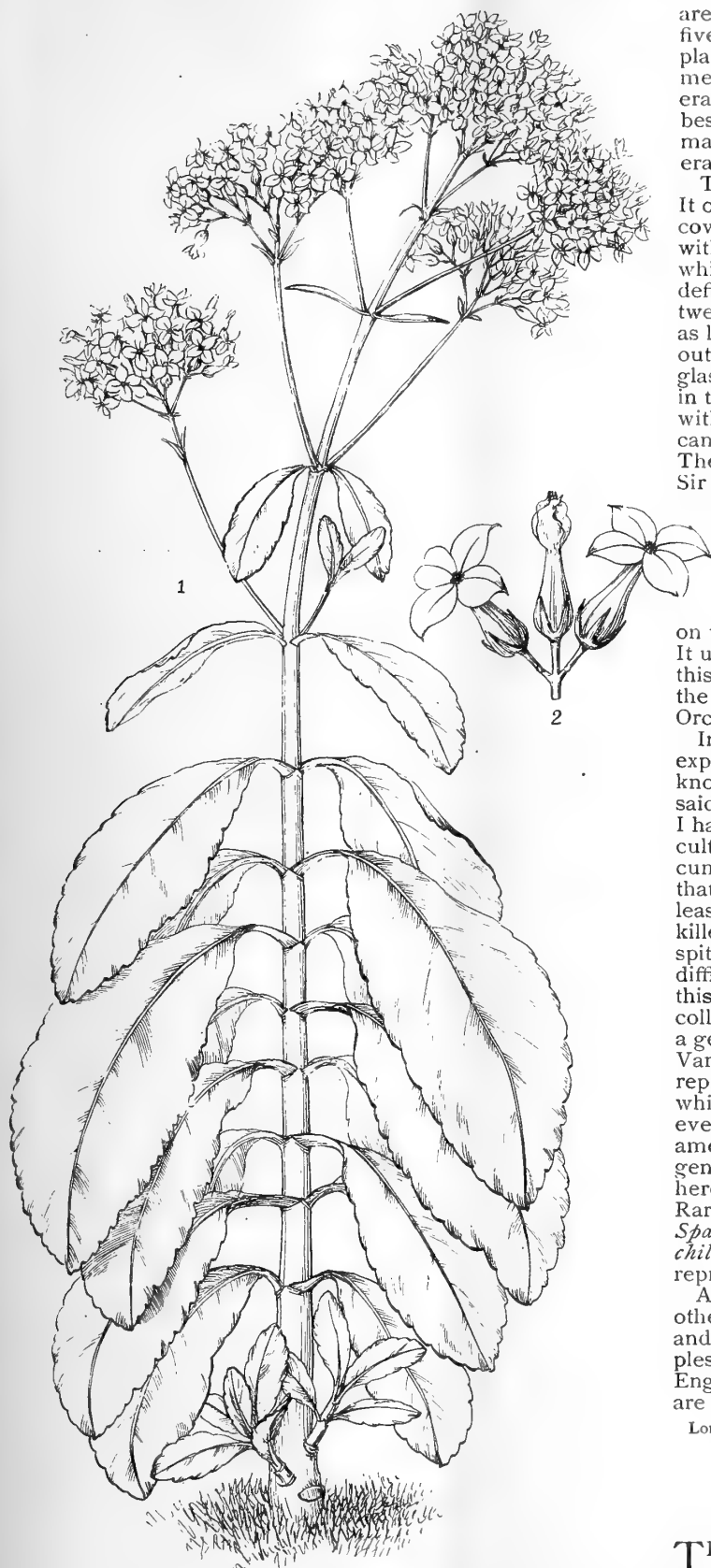
Foreign Correspondence.

The Gardens at Burford Lodge.

PROBABLY some of your readers who are interested in Orchids will like to hear something of a garden which has become famous wherever Orchids are grown.

Among amateur Orchid-growers in England, Sir Trevor Lawrence, President of the Royal Horticultural Society, has long been the acknowledged prince. He commenced about fifteen years ago to collect and cultivate Orchids in his delightfully situated garden under the lee of Box Hill, Dorking, in the county of Surrey, twenty miles from London Bridge. About five years later it was acknowledged that no collection in England possessed as much interest or testified to as much cultural skill as this; the health and cleanliness of the plants, the orderliness and convenience of the houses being such as were scarcely ever met with elsewhere. This may be said of Sir Trevor's garden to-day. There are and have been collections of Orchids almost if not quite as rich in number and rarity of species, but they have not lasted long, and the only English collection which may be said to rival Sir Trevor's at the present time is that of Baron Schröder, at Egham, near Windsor. The marked difference between the two is that while the Burford Lodge collection contains almost every Orchid that is popular and beautiful it also admits many plants which have only a botanical interest. Sir Joseph Hooker recognized the exceptional services of Sir Trevor to horticulture by dedicating to him in 1886 the hundredth volume of the *Botanical Magazine*, and he associated with Sir Trevor's name "that of the distinguished lady from whom you directly inherit your love of plants and passion for gardening, the late Mrs. Lawrence, of Ealing Park, whose liberality and whose rich and beautiful conservatories were well set forth by my predecessor in the dedication to her of the sixty-eighth volume, published in 1842, of this work, and whose kindness to myself when a very young botanist, I shall ever hold in grateful remembrance."

Ealing Park about fifty years ago was probably the richest and most beautiful in England. Orchids, hard-wooded plants, stove plants, hardy trees and shrubs were cultivated there most successfully, as was proved by the place they took in the great exhibitions which were then held by the Royal Horticultural Society. In a description of this once famous garden, written at that time, mention is made of four houses, sixty-five feet by seventeen feet, filled with New Holland plants, amongst them magnificent specimens, four or five feet through, of such plants as *Leschenaultia*, *Boronia*, *Gastrolobium*, *Pultenaea* and *Chorizema*. Another house, forty feet by sixteen feet, contained nothing but *Ericas*, many of them large specimens of species which are not now known in English gardens. Reared in the midst of such surroundings, Sir Trevor could hardly help acquiring a great love for plants and taste for horticulture. When he succeeded Lord Aberdare as President of the Royal Horticultural Society it was rapidly sinking into ruin, and it had ceased to represent and lead English horticulture. Thanks, however, to the new departure decided upon soon after Sir Trevor's election to the presidency of the Society, it has been restored to activity and usefulness, and the Society is now rapidly gaining the respect and support of every one interested in horticulture.

Fig. 14.—*Kalanchoe carnea*.—See page 52.

It is the boast of Sir Trevor Lawrence that he is his own gardener. He does not, however, deny to his men the credit due to them for the successes achieved in his garden, and amongst them to one who stood head and shoulders above all Orchid-growers of his time, the late Mr. Spyers. Mr. Spyers was a gardener by instinct, as much as by training, and we are indebted to his extraordinary skill in arriving at the treatment best suited to many plants which had baffled others, or of which cultivators were in ignorance, for many Orchids which

are now grown with ease. Mr. Spyers died suddenly about five years ago, when still a young man. A garden rich in plants and perfectly managed, where some half dozen young men are employed amongst the Orchids, must effect a considerable amount of good in horticulture by training men in the best methods of cultivation. In this way a few good, well managed gardens are of immense benefit to horticulture generally.

The garden at Burford Lodge is what would be called small. It occupies about twenty acres, a large proportion of which is covered with grass and plantations. These latter are filled with Ferns, Daffodils, Primroses, Bluebells, etc., through which moss-grown paths meander naturally, and are roughly defined by patches of Ground Ivy. The houses number twelve, none of them being large. In construction they are as light as possible, the wood-work painted white inside and out, being only strong enough to carry the broad panes of glass. In winter it almost seems as if there were more light in these houses than there is outside. The stages are covered with spar, and beneath them is planted *Selaginella*, *Tradescantia*, etc. There is absolutely no attempt at ornamentation. The houses are built solely for the plants, and are designed by Sir Trevor himself.

The collection of Orchids comprises almost every species and variety of any horticultural interest, and a great many which are termed "botanical Orchids." If there is a good and rare plant in the market it is almost certain to be secured for Burford Lodge unless it be already there. Sir Trevor is a liberal buyer. Any plant on which he has set his mind he gets, no matter what it costs. It used to be said that of every importation of Orchids into this country the best plants went to Sir Trevor's garden. At the public auction rooms, at the nurseries, wherever there are Orchids worth having, there Sir Trevor is a frequent visitor.

In his address at the Orchid Conference in 1885 Sir Trevor expressed the opinion that of the 5,000 species of Orchids known close upon 2,000 were in cultivation. "I can say," he said, "with regard to one particular genus, *Dendrobium*, that I have had in my own collection upward of 100 species under cultivation at the same time. There is another curious circumstance to be noted in connection with Orchids, and that is, that I do not see, in the case of most of them, that there is the least reason why they should ever die . . . unless they are killed by errors of cultivation." Many growers find that, in spite of the most careful treatment, a great many Orchids are difficult to keep in cultivation. Yet Sir Trevor's remarks on this point are to some extent confirmed by the contents of his collection, many of which have been in his possession almost a generation. *Cattleya*, *Dendrobium*, *Cypripedium*, *Cælogyne*, *Vanda*, *Odontoglossum*, *Oncidium* and *Masdevallia* are each represented by scores, in some cases hundreds of kinds, whilst such genera as *Epidendrum*, *Catasetum*, *Brassia*, and even *Pleurothallis*, are not omitted. Hybrids have been raised amongst *Dendrobiums*, *Cypripediums* and several other genera at Burford Lodge, the fine race of *Calanthe* produced here being a special feature of this garden at this time of year. Rare plants, such as *Grammatophyllum speciosum*, *G. Ellisii*, *Spathoglottis aurea* (Kimballiana), *Renanthera Storeyi*, *Lissochilus giganteus*, and others scarcely known elsewhere, are represented here by large, healthy specimens.

Although famous chiefly for orchidaceous plants, yet the other departments of Sir Trevor's garden are well managed, and contain many choice and rare plants in well grown examples. Probably there is no other garden of the same size in England where so many beautiful, rare and interesting plants are collected together and grown so successfully.

London.

W. Watson.

Cultural Department.

Notes on Grafting.

THE influence of stocks upon the scions or buds grafted and budded upon them is a subject which is often discussed and which is as yet very imperfectly understood. General experience maintains the theory that the leaves, flowers and fruit, as well as the woody parts, of a grafted or budded plant are essentially the same as those on the plant from which the scions or buds were originally taken, and that the plantfood taken up by the roots of the stock imparts little or no influence of its own quality or character when transmitted to the cells, and through them, to the growing parts of the introduced graft or bud. On the other hand, the variations recorded by Darwin and others show that a mixture of qualities may take place, and the so-called "graft hybrids" are

exceptions which invite unlimited study and experiment with a promise of some interesting results.

Although the physiological reasons for these phenomena of growth are as yet so little understood, the visible results brought about by the practices of the horticulturist are often very striking and well marked.

Considered in its practical aspect it is surprising to find, after such a long period of usage, so few authoritative accounts indicating the full value of any stock for any special purpose. The French horticulturists seem, more than others, to have made advances in the practice of grafting and the study of its results, and some of their manuals and notices of the subject contain much valuable information for the amateur. Undoubtedly a great impetus has been given to the study by the practice, in recent years, of grafting the wine-producing grapes of France upon the roots of American species in order to check ravages by Phylloxera.

We know that when scions of some species are grafted upon stocks of an allied species, or sometimes even on a different plant of the same species, an increased vigor often results. Michaux states that the striped Maple (*Acer Pennsylvanicum*) when grafted on stock of the Sycamore Maple (*A. Pseudo-platanus*) increased to four times its natural size.

There is almost no limit to the possibilities of inter-grafting between plants of the same species; but how far grafting may be successfully and economically carried between different species or allied genera is a matter of which comparatively little is known. The practice of grafting the Pear upon stock of the Quince (*Pyrus Cydonia*) is one of the few cases where long usage has made the results familiar to all, and the difference between the Pear grafted upon Quince stock and a Pear grafted on seedling Pear-trees is well marked. Thus it has been found, as a rule, that successful grafting is fully as easy on Quince as on Pear-stock; that growth on the Quince-stock, though more vigorous the first year, becomes less vigorous in succeeding years than when grafted on Pear-stock; when grafted on Quince fruit may be produced in two or three years, while on Pear-stock it cannot be expected for at least five or six years. The fruit is usually finer, larger and relatively more abundant on Quince-stock, but the trees are dwarfed, and, as a rule, are short lived, while they become large and are comparatively long lived when grafted on Pear. It is also noticed that the graft on Quince increases in diameter much faster than the stock and that the joining of the stock and graft is never so perfect as it is when the Pear is grafted on Pear stock.

Other points have been noted, and although much depends upon climate, soil and other conditions, and still more upon the character of some varieties of the Pear, the foregoing observations may be taken as an example of what is desirable in the knowledge of the value, as stocks, of hundreds of our trees, shrubs and vines. To know what stock will produce the best, longest lived plants of a variety grafted upon it, and, at the same time, give the most satisfaction in the abundance and quality of the flower or fruit, is certainly of great importance to the horticulturist. It seems to be true that certain stocks have an influence in hastening or retarding the leafing, flowering and fruiting of some plants; and the hardiness of some rather tender species often appears to be increased by grafting upon hardy stocks, probably because the wood becomes ripener and better matured before winter frosts.

No regular series of experiments in grafting has as yet been attempted at the Arnold Arboretum; but Mr. Jackson Dawson, the propagator, has tried a great variety of stocks, and while, as was to have been expected, many of them have so far proved failures, others appear successful and worthy of notice.

The following notes made within a few weeks among the plants in the collections and nurseries are given, because they may be of interest to others working in the same direction. Among such young plants time alone will tell what the ultimate result and value will be.

One of the most interesting cases is that of five specimens of western Larch (*Larix occidentalis*), all growing near each other in the same soil and receiving the same treatment. Three of the specimens were produced from seed collected in Oregon and sown in November, 1881. Two of them are five feet and the other three and one-half feet in height, and all have stems three inches in circumference at one foot from the ground. The greatest spread of branches is three and one-half feet.

The other two plants were grafts taken from some of the above lot of seedlings in January, 1884, and grafted upon stock of a Japanese Larch (*L. leptolepis*).

These are now seven feet high, and have stems six inches in circumference at one foot from the ground. The greatest

spread of the branches is five and a half feet. The point of insertion of the graft is not apparent in either plant. The seedling plants lose their leaves a little earlier, and are much more straggling in habit than the grafted specimens. Until within a few years it was not considered practicable to graft the Hickory. Young seedling and grafted specimens of these trees grown under the same conditions, show, in some cases, a little advantage in favor of grafting. As yet the only stock used at the Arboretum has been *Hicoria ovata* (*Carya alba*). A variety of *Hicoria ovata* grafted in March, 1887, is now over two feet high, and of four seedlings planted beside it, the seed of which was planted in October, 1883, three specimens are two and one-half feet high and the fourth over one and one-half feet. The scion of the grafted plant was only three or four inches long when inserted in the stock. No marked difference in size or vigor has as yet appeared in seedling and grafted specimens of *Hicoria sulcata* (*Carya sulcata*) now six or seven years old. The Hickories offer a field for interesting experiments to determine which are the best stocks for grafting purposes.

Among the Oaks, the English Oak (*Quercus Robur*) is found to be the best for all purposes as a stock. The only plants measured for comparison were two plants, growing side by side, of the dwarf Georgia Oak (*Q. Georgiana*). One of these, grown from seed collected in Georgia in November, 1876, is four feet high, and the other, grafted on roots of young plants of *Q. Robur* in January, 1884, is now over seven feet in height. The stock in this case increases in diameter faster than the graft. The seedling plants have been occasionally partially killed in winter, while the grafted plants appear to sustain no injury.

Another interesting case is that of a south-western Ash (*Fraxinus anomala*), in which grafted specimens again show greater hardiness and faster growth over those not grafted. Of two healthy plants growing side by side under exactly the same conditions, the seedling plant is now four and a half feet high. The seed of this was collected in Utah and sown in 1874. The other plant is from a graft taken from the above lot of seed-grown plants and grafted on a seedling of the common White Ash (*F. Americana*) in February, 1882. It is now over nine feet high and appears vigorous and hardy, while the seedling plant has often been injured in winter. Other plants of these lots show the same proportionate rate of growth, vigor and hardiness. The various species of Amelanchier and Cotoneaster grow vigorously when grafted on the European Mountain Ash (*Pyrus aucuparia*), and the former appears to thrive fairly well on stock of English Hawthorn (*Crataegus Oxyacantha*), while the latter seems to do very poorly.

The Pear is commonly known to grow well on *Crataegus*, but, no doubt, a great difference would be found in the value of the various species of thorn for stock. Some varieties of Pear, budded upon strong roots of the native scarlet Haw (*C. coccinea*, var.), have been known to grow with extraordinary rapidity and to produce large crops of fruit within three or four years, but, in the cases which have come under my notice, the stems of the Pear-trees increased in size much faster than the stock, so that the disproportion became very great and the plants died while quite young.

The increased longevity and value of the Peach when grafted on Almond or Plum-stock is well known, and there is reason to believe that stocks of the different species of Plum would produce such varying results that they would be well worth testing comparatively.

The value and advantage of grafting many of our choice varieties of Roses is now generally conceded, but there are still differences of opinion as to the best stock for such purposes. The Dog Rose (*R. canina*) and the stock known as the Manetti are those in most common use. In recent years the Japanese *Rosa multiflora* of Thunberg has been employed to some extent as a stock, and, at the Arboretum, a Japanese species recently described by F. Crépin as *Rosa Watsoniana* has been used with satisfactory results. Its peculiar advantage as a stock over the old species in use and over *R. multiflora* (of which it may be a form) lies in the fact that the suckers and stray shoots from the stock may be at once detected by the slender, long, narrow leaves which are very different from those of all other Roses. Similarity of foliage often renders it troublesome to distinguish the graft of a Rose from the stock. *Rosa Watsoniana* appears to be less vigorous in habit of growth than the other kinds used for grafting purposes. The Japan Quince (*Pyrus Japonica*) grows poorly on the English Hawthorn, and has refused to adhere to Apple stock for any length of time. But the Chokeberry (*Pyrus arbutifolia*) thrives remarkably well on the European

Mountain Ash. The Hobble-bush (*Viburnum lantanoides*) has not always been found to take kindly to cultivation when transplanted from its native woods, and the advantage of grafting it on *V. dentatum* has already been referred to in a recent issue of GARDEN AND FOREST.

Arnold Arboretum.

J. G. Jack.

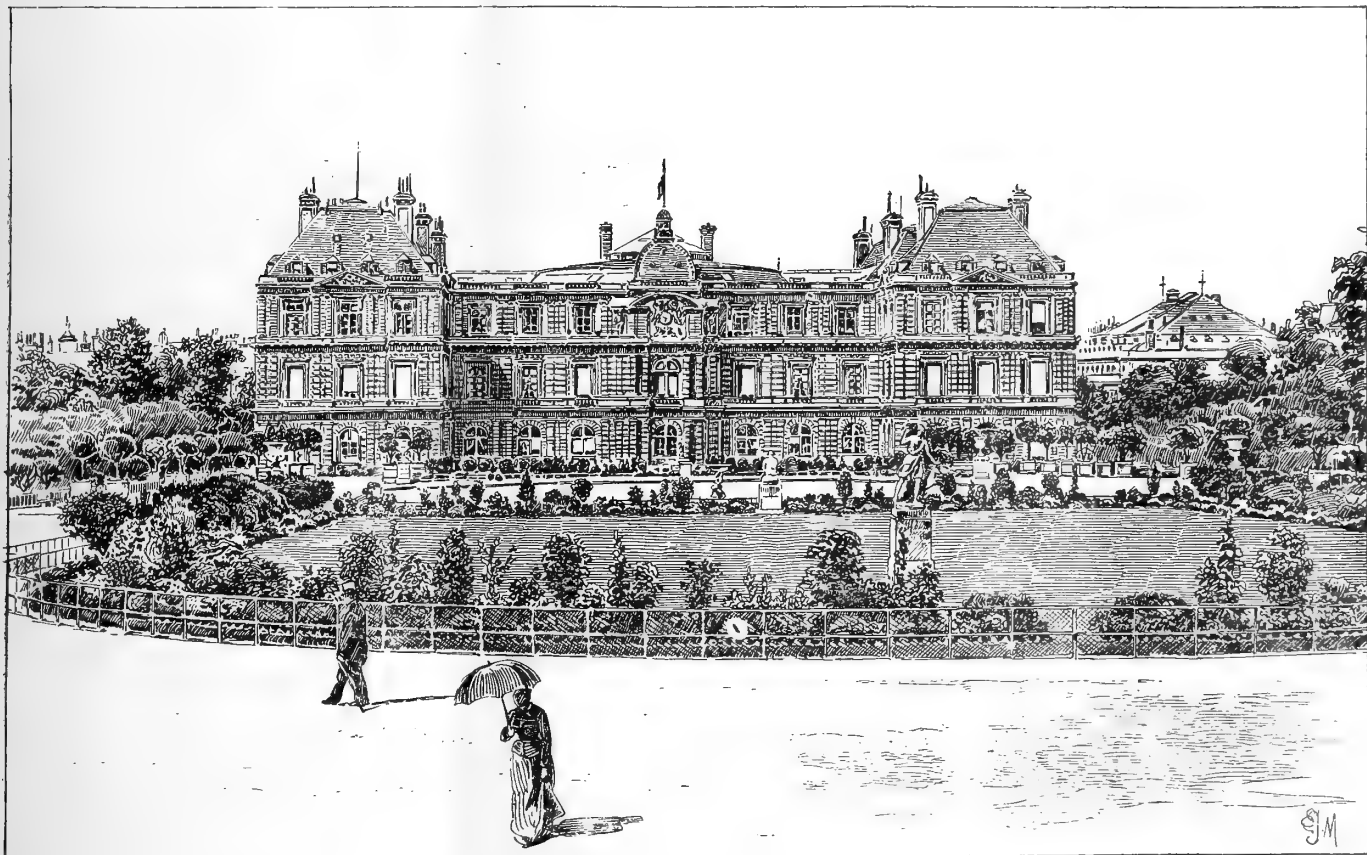
Water Lilies for the Million.

COMPARATIVELY few lovers of flowers can indulge in the luxury of growing Water Lilies in an aquatic-house, and few can afford sufficient space in a greenhouse for such a tank as G. B. recommends in vol. iii., p. 20, of GARDEN AND FOREST. But these plants can be more cheaply grown; and I will give a few directions from my own experience, in the hope that many lovers of flowers will be induced to take up the culture of these beautiful exotics.

The Water Lilies of the tropics require heat to start them and to flower them successfully, the dormant bulbs starting at a temperature not below eighty degrees. Our summers are not enough to flower them successfully out-of-doors, and plants sufficiently advanced to place in the Lily-tank can be purchased in May and June at \$2.50 to \$10 each. This is the

sixty degrees, but the growth will not be so rapid. When the plants have made three or four leaves they may be potted singly into three-inch pots, using the same mixture of soil. At this stage they will require more room. Shallow tubs or other convenient vessels may be used to place the pots in, but no more than three inches of water should be over the tops of the pots, and they should be kept in the full light to prevent the leaves from being drawn. Where several plants are placed close together care must be taken when it becomes necessary to move them, or the leaves will get entangled. The water can be changed by simply adding more, and allowing it to run over. A good plan is to put an inch or two of sand in the bottom of the tubs to steady the pots, but the plants must not be allowed to make roots through into the sand.

As soon as the pots are full of roots they may be potted again into five-inch or six-inch pots, using good loam and well rotted manure. Three plants will be enough to place in tubs (kerosene barrels cut in two answer well). When the pots are full of roots they are fit to plant in their summer quarters. One plant will then be sufficient in a tub. Three can be planted if the tubs are to be sunk in a tank, but they will



The Garden Front of the Luxembourg Palace.—See page 50.

barrier to more general cultivation. But seed of several varieties of *Nymphaea* are now advertised by leading houses at the moderate price of fifty cents a packet, and if care in cultivation is given fifty per cent. will, in many cases, germinate. Seed may be sown from January to March in shallow pots or pans of sandy soil. Those who possess a greenhouse will find no difficulty in maintaining the required temperature. The pots of seed should be placed in a shallow vessel filled with water, and directly on the heating-pipes, and kept dark or shaded till the seed germinates. Then all the light possible should be given. Those who do not possess a greenhouse may find some means whereby seed can be raised. A frame of common boards, six inches deep for the sides and ends, and covering with sheets of glass, would do for this purpose, provided a kerosene lamp was used underneath to keep the required temperature. When the seedlings are large enough to handle prick them off into seed-pans, using good loam, leaf soil and well rotted manure, in equal parts, rubbed through a fine sieve. Place the pans in shallow tubs, covering with about an inch of water, and it will not be necessary to place again directly on the pipes, but keep them in a temperature of about seventy degrees. They will not die in a temperature of

be crowded and the flowers will be smaller. If the plants are to remain in the tubs through the season, and not sunk in a tank, more space must be left for water. Use the same soil as when potting into six-inch pots, and finish off with two inches of clean sand. The plants will flower well in these tubs if kept constantly filled with water, but if at all vigorous, they will push their leaves over the edges of the tubs out of the water, and the sun will scorch them and check their growth. It is much better to place the tubs in a tank. The tank in which I have flowered Water Lilies successfully has been simply a hole of the desired dimensions, dug in a convenient and sheltered spot, yet open to the sun and having the sides and bottom concreted and finished off with Portland cement. An eight-inch brick wall would be more substantial, and consequently better, but my method may be used at first, and the brick-work left till a season's experience suggests improvements.

A very convenient size for a tank is five feet six inches wide, inside measurement, and not more than two feet deep. The sides should slope if concrete is used and an edge of a single brick will prevent the rim from being broken. If on the lawn keep the edge of the tank three inches below the

ground level. This will allow a sod to be laid and the grass will cover the unsightly brick border. With a tank of these dimensions a garden-frame and sashes may be placed over it, and the tubs can be set in much earlier so that the sun's rays will warm the water several degrees and the season can be considerably advanced. The same protection can be given in the fall and Water Lilies may be had for Thanksgiving.

In such a tank I have grown in tubs *Nymphæa Zanzibarensis*, *N. Zanzibarensis azurea*, *N. Zanzibarensis rosea*, *N. alba candidissima*, *N. odorata rosea*, *N. dentata* and *N. Devoniensis*, and have cut flowers of the Zanzibarensis varieties ten and a quarter inches in diameter, with leaves which measured twenty-two inches in diameter. *N. Devoniensis* is a superb night-flowering variety, as is *N. dentata*.

N. alba candidissima is the queen of white Water Lilies, but is not fragrant. It is hardy, however, as is also *N. odorata rosea* and *Nelumbium speciosum*. The latter will not do well in a tub with the same culture as *Nymphæa*, but should be planted out in the Lily-pond or aquatic garden. All hardy Lilies should be planted in deeper water than is recommended for the Lily-tank, as they will not bear freezing. All varieties of *N. Zanzibarensis* and *N. odorata rosea* (the Cape Cod Pink Water Lily) have most delicately scented flowers and can be raised from seed.

No mention has been made of an overflow or draw-off in connection with the tank, for I have none. There is always a certain amount of evaporation going on, according to conditions of the atmosphere, and it is only necessary to keep filling the tank up with rain water or spring water. In emptying, I syphon with a length of hose having a fall of two feet in fifty. To keep the water clean and free from mosquito-larvæ, a few gold fish are useful and add immensely to the general appearance of the tank.

Staten Island.

T. W.

Perennials From Seed.—II.

THE compost which is found suitable for all kinds of perennial plants is a mixture of loam and well decomposed leaf mould, in equal quantities, with the addition of a shovelful of charcoal dust to the bushel of soil. Should the loam be of a clayey nature, a shovelful of sand should be added. The influence of the charcoal is purely mechanical, but the benefits derived from its use cannot be overestimated. Before using it, we often found that, during a period of dull weather, the young seedling plants damped off in quantities, causing serious loss and disappointment. The charcoal has obviated this, but it necessitates a more frequent use of the watering pot. Before using, the soil should be passed through a quarter-inch sieve and thoroughly mixed, keeping a sharp look out for worms, which make trouble in the seed-pan. The soil, when in fit condition for use should by no means be dry, but it should not be so wet that any portion of it adheres to the hands. We use shallow seed-pans of two sizes, the smaller being four inches wide and two deep; the larger, seven inches wide and two and a half deep. Pans are preferable to boxes, unless the latter be new, as in old wood there is always a tendency to fungoid growth. The pans should be filled with soil to within a fourth of an inch of the top, and this should be made moderately firm and smooth with the bottom of another pan. The seed may then be sown evenly and covered with soil sifted through a fine sieve made of wire mosquito-netting. The soil left in the sieve should be used in the bottom of the next pan as drainage. Care must be taken not to cover the seeds too deeply; if they are barely hidden the covering will suffice. Many people advocate sowing small seeds without any covering. This necessitates shading from the sun, and if the seed be not quick to germinate, a mossy growth often covers the surface, through which it is difficult for small seeds to penetrate. Should this growth appear on the surface of the soil it may be smothered by sprinkling sand on it. When the seeds are sown the soil that covers them should on no account be pressed, as this renders germination very difficult with many kinds of plants, especially those that have small seeds. The pans should be watered as soon as sown, and after this must never become quite dry, neither must the pans be filled so full that the seeds can be washed out. Pots may be used in the absence of pans, but pots must be filled half their depth with broken crocks as drainage. Under the above treatment the majority of perennial plants may be raised from seed in a period varying from a week to two months, but, as has been already stated, many kinds are naturally slow to germinate, and the pans containing these may, during summer, be plunged in sand in a cold frame. When treated thus, less water will be required, and the soil will not become sour.

Passaic, N. J.

E. O. Orpet.

Begonia Socotrana.—When this plant was first sent out by the Messrs. Veitch, of London, a few years ago, it was warmly praised by horticulturists, and many predicted a great future for it. Every one who saw it flowering for the first time, through the dismal fog and general desolation of a London winter, was charmed with the beauty of its flowers and the healthy luxuriance of its growth; and, if I remember correctly, there were a few plants of it grown in one of the private houses in the gardens at Kew for some time before it was sent out commercially, that were shown with great satisfaction to visitors of prominence. In beauty or utility it has not degenerated since that time, and it now stands amongst the best of a group of plants that has been extraordinarily prolific of good things for garden and greenhouse. The plant is held in high esteem for the bright pink flowers it produces through the winter. It is dwarf and stocky, growing from nine to eighteen inches in height, and the flowers are borne in clusters well above the characteristic circular leaves. The leaves are smooth, of a pleasing light green shade, and average about six inches in diameter. Its cultural requirements do not differ essentially from those of other Begonias, except in the matter of resting. During the summer months, when most other species are full of vigor, this one should be completely at rest; and then about the beginning of October, the roots should be shaken out and the plants repotted in a mixture of good loam and thoroughly decayed farm-yard manure in equal parts, with a little sand and leaf-mould. Little heat is needed until the plants show signs of growth, when they should be removed to an intermediate temperature, as such an atmosphere suits them while growing better than any other. If the plants are kept close to the glass they will assume a neater and more compact form than otherwise.

Chorizemas.—Where a continuous display of flowers is required through winter attention should be given to this group of plants, for they are most attractive in the greenhouse or conservatory. The most desirable species are all natives of Australia, and thrive most satisfactorily in an ordinary greenhouse among other plants. They are hard-wooded, and of free growth. The branches being somewhat slender, however, are all the better for the support of a trellis, or stakes. In most of the species the leaves are spiny and of a dark green color. The bright colored flowers resemble those of the ordinary Pea in form, but are rather smaller. What they lack in size is more than counterbalanced by quantity, as they are produced most abundantly on the tips of the young shoots. The prevailing colors of the flowers are red and yellow, in different shades and mixtures. The most useful species are *C. cordatum*, with flowers red and yellow; *C. Henchmanii*, scarlet; *C. ilicifolium*, yellow; *C. spectabile*, orange and red. There are many other species and varieties, but these are among the best, and they afford the widest range of color. Plants raised from seed, sown soon after it ripens, always give satisfaction; but it is also possible to raise good plants from cuttings of the young wood. Some care is necessary in rooting the cuttings as they are very liable to damp off. Their general culture consists of rather hard pruning when the plants have ceased to flower, and of repotting, when they commence to grow again, in a mixture of fibrous peat, rich loam, and sand in equal parts. Care should be taken to pot firmly and to keep the roots rather confined than otherwise, as the plants flower most freely when slightly pot-bound. Abundance of air and light is essential at all times; and in summer they should be placed in the open air, that the new growth may become thoroughly ripened. Before removal to their winter quarters the plants should be tied into shape; and it will add to the gracefulness of their appearance if they are afterwards allowed to develop their flowering shoots naturally. Some growers keep all the shoots tied-in severely, but this process adds nothing to the beauty of the plants.

Botanic Garden, Cambridge, Mass.

M. Barker.

Seedling Chrysanthemums.—The perennial Chrysanthemums are so readily obtained from seed that even when one has a choice collection there is a great pleasure in trying a few seedlings with a certainty of vigorous, thrifty plants, a profusion of very varied bloom during the same season, and a possibility of a strikingly new and valuable variety. This is the proper season for sowing, which may be done in pans, pots or boxes, as the seeds germinate in ten days or a fortnight in moderate warmth. The young plants should be picked out in flats filled with a rich compost as soon as possible, and kept growing slowly at a moderate temperature, as well up to the light as possible. Shift them when necessary, the object being to secure strong, stocky plants with an abundance of good roots. Give all the air practicable

at all times, and as soon as possible harden them off without checking, so that they may be placed in cold frames to grow on slowly until chilling spring winds have ceased, when they may be planted out. The main objection to growing seedlings is that at flowering time the bushes take up valuable room, and, many being worthless, the space is more profitably occupied by varieties of approved excellence. This objection is well taken, but is obviated very readily. The most approved system among the growers now is to plant the seedlings in nursery rows, where they are easily cultivated, and allowed to grow away without removal of branches or suckers. A seedling *Chrysanthemum* is a wonderfully vigorous and thrifty plant, far exceeding in these respects a plant grown from a slip. In early June the plants are all numbered, and a few strong cuttings are taken from each and struck in a gentle bottom heat from manure. They root quickly, are shifted along into five or six-inch pots, are carefully cultivated and disbudded, and show, under this test, very closely their value. It will be seen that under this system no room is wasted, as the test takes little space; if the plant is of no value it is left out to be thrown away, but if worth propagating, one has not only the tested plants, but a good, vigorous bush full of branches and suckers, from which a large stock may be had at once, a very important point when one considers the value of new varieties of merit. The chance of securing a first-rate variety from seeds such as are ordinarily to be had is very slight, but the pleasure of watching the whole life of the plant—the germination of seed, the wonderfully thrifty growth and the amazing bloom, will repay any flower-fancier.

Elizabeth, N. J.

G.

Correspondence.

The Knees of the Bald Cypress.

To the Editor of GARDEN AND FOREST:

Sir.—I have read the interesting essay of Dr. Lamborn in your issue for January 8th with great pleasure. My own observations on the knees of the Cypress do not seem to me reconcilable with Dr. Lamborn's hypothesis. The objections which they raise to it are as follows:

1st. The trees on the sandy uplands need the assumed support quite as much, if not more, than those which grow on the neighboring loam—often clayey—of the inundated bottoms, yet these upland forms always lack the excrescences.

2d. While a slight upward growing protuberance would doubtless strengthen the root, the tall column exhibited by many knees would have no value in this regard.

3d. The summits of the knees normally attain a height which brings them above the level of the water in the growing season; when they cannot attain this elevation the tree fails to develop. When, by the subsidence of the land at an earthquake, or the artificial flooding of the area by dams, the crests of the knees are brought under permanent water, the condition is fatal to the plant.

4th. The fact that the Cypress-knees serve as respiratory organs is made the more probable by the existence of sharp upward flexures of the roots of the Tupelo (see "Effect of permanent moisture on certain forest trees" in *Science* (xiii., 176; March, 1889). These flexures, as there shown, are horse-shoe-shaped curves of the whole root, which, like the Cypress-knees, rise above the level of permanent water. On the Tupelo these structures are clearly of no advantage as anchors. Dr. Wilson and others have shown that similar structures exist in many plants.

I was aware that roots extended downward from the base of the Cypress-knees, but it seemed to me that the position of these roots was to be attributed to disturbance in the circulation and growth, brought about by the development of the knees rather than that the knees gave rise to the vertical roots.

Although I cannot at present agree with Dr. Lamborn in his main view, his paper seems to me a very important contribution to a discussion which promises to throw much light on the laws of plant development.

Harvard University.

N. S. Shaler.

The Chinese Persimmon.

To the Editor of GARDEN AND FOREST:

Sir.—I read on page 612 of the second volume of GARDEN AND FOREST a note from one of your southern correspondents relating to Japanese Persimmons, which leads me to believe that you have only the Kiki of Japan, the *Diospyros*, Si-Tché of Bunge, in the United States. But there is another and very distinct Asiatic species, the *D. Sinensis* of the same botanist,

which we cultivate at the Villa Thuret and which produces excellent fruit here.

The Chinese Persimmon is not as hardy as the Kiki of Japan, the leaves are more persistent and the habit is different. The flowers are smaller and yellower, the globular fruit does not turn red in ripening, and at maturity it is yellowish green and the size of an apricot, with sweet flesh, and generally contains several seeds. This species could, no doubt, be crossed with your Virginia Persimmon, a cross which might produce interesting and valuable results.

I have noticed that the seeds of *Diospyros* lose their power of germination almost immediately when they are exposed to the atmosphere, and, like Orange seeds, they should be preserved in the fruit until the planting season arrives.

Antibes, France.

C. Naudin.

The Western New York Horticultural Society.

The Annual Meeting at Rochester.

THIS society, which is mainly composed of progressive and successful fruit-growers, held its thirty-fifth annual meeting at Rochester last week, and the proceedings were characterized by a business-like directness and expedition which is always expected there, but rarely seen in similar gatherings elsewhere. Practical and instructive papers and discussions, together with promptness, precision and system in the conduct of business, and all pervaded by unflinching good humor and fraternal feeling, constitute a positive educational force, so that these meetings have a direct value which is recognized and appreciated. Mr. Patrick Barry, who has been the efficient President of the society for more than thirty years, was unable to attend the sessions or to prepare his usual address. He sent a letter, however, offering his resignation on account of years and infirmities, but this was met with a unanimous declaration that so long as he could sign his name he must allow himself to be considered as the executive head of the body over which he had for so long a time and so acceptably presided. It was announced that Mr. George Ellwanger had given \$1,000 to the permanent fund started by Mr. Barry last year for the society, and additional contributions increased it to more than \$4,000. Abstracts of some of the papers and notes from the various Committee Reports and from the discussions are given below, and will be continued in our next issue.

FORCING VEGETABLES UNDER GLASS.

This was the subject of an admirable paper by Professor L. H. Bailey, the greater portion of which here follows: During recent years great progress in the forcing of plants has been made in two general directions: First, in improved methods of constructing and heating glass houses; second, in the increased knowledge of the demands of particular plants. Many garden vegetables are now grown during winter with profit, and the number is constantly increasing. This business of forcing esculent plants is a special business, requiring a particular kind of knowledge and careful attention, and therefore, in common with all special businesses, it is profitable when properly handled, and it is not likely to be overdone. As a rule, the most difficult crops are the most profitable. Yet there are no great difficulties attending the forcing of plants, as most people seem to suppose. The business demands only care and thoughtfulness. The demand for certain kinds of winter vegetables is steady and is rarely weakened by overproduction. Winter gardening is a business which, in a peculiar way, pieces out and supplements the horticultural operations of the year, superseding the unprofitable link of winter idleness.

The most important advance in winter gardening lies in the improved construction of glass houses; and this consists not so much in the mechanism of the building as in the application of the laws of nature to plant growth. And this improvement has resulted not only in producing better plants at lower cost, but it has reduced the cost of building the houses. The first feature of the improvement is found in the relations of the house to light. The gardeners of a century ago were aware of the value of light for forcing plants; but they were not successful in securing it. Efforts were made in the early part of the century to construct the roof at such angles as would catch the most rays of light, for it is well known that

if the sun's rays strike glass roofs at right angles the greatest economy of light will result. The roofs were, therefore, built with such slopes that they would stand as nearly as possible at right angles to the sun's rays in the coldest months of the year. It soon became evident, however, that in the houses of most approved construction the slanting rays of morning and evening must be largely reflected. Hence, there arose various special forms of roofs designed to present some surface at right angles to the sun at all hours of the day. The most popular of these was the curvilinear roof. In its ideal conception it demands a house circular or nearly circular in form. Various fluted roofs were also devised; the most famous of which was one erected at Chatsworth, by Sir Joseph Paxton. This latter style of roof demanded so much more material that much additional cost was incurred with little gain in the amount of light. The curvilinear roof, in its modified forms, is still popular for conservatories, but it is not adapted to the forcing of vegetables.

The old-fashioned circular and dome-shaped houses have come to be historical curiosities. They possess a radical defect; the roof is too high, too far away from the plants. We are now reversing the endeavors of the old gardeners by taking our plants to the light rather than by taking the light to the plants. In other words, we must get our plants near the glass if we demand quick growth. Fifty years ago Loudon was one of the first to perceive the defects in the old houses. "It is found," he says, "that the rays of light, after passing through glass roofs, lose their influence on the plants within in proportion to their distance from the glass. Hence, for general purposes a long, narrow house is the best." Loudon's statement was largely a prophecy, and we are reaping the realization of it. The ideal form of a forcing-house is one which is long, narrow, low, and more or less flat. It is more economical in construction than the old style of house, while the results obtained are incomparably better. Every gardener knows that if he would grow good and profitable crops of any low vegetable in a house he must get his plants near to the glass. The low and narrow houses possess other advantages over the old-fashioned circular and rectangular structures. Or, to quote Loudon again, "there is another reason in favor of narrow houses where perfection of growth and economy are objects, which is, that a considerable portion of the heat by which the temperature of hot-houses is maintained, is supplied by the sun." Sun heat is better than artificial heat. The curvilinear form of roof is now combined with the long and narrow form of structure, and this gives a house of peculiar value for growing some ornamentals, because it gives sufficient height for them to grow without greatly increasing the height of the house. For the forcing of kitchen garden vegetables, however, this added height of the curvilinear roof is a positive disadvantage. And all curvilinear roofs are more expensive than direct roofs.

Of recent years we have also added greatly to the light in houses by the use of large panes of glass. The glass is also better than it was formerly. This improvement of glass lies: (1) In greater transparency, due mostly to greater thinness, and (2) In greater regularity in its surfaces. Early in the century panes 3 x 5 inches were largely used, chiefly because panes of this size could be made very thin and regular. When larger panes began to be used better results were not reached, simply because the surfaces of the glass were so uneven that much light was reflected and refracted.

The second feature of improvement is found in methods of heating. No subject connected with glass structures has been the occasion of such violent discussions during the last few years as the various methods of heating. The fact that these discussions exist is proof of progress, for agitation always means revolution or improvement. We are emerging from the old hot-water system into better and more economical methods. These later methods are steam heating and improved hot-water heating. The old style of cast iron pipes laid exclusively under the benches is being replaced by ordinary gas-pipe, whether the heat be applied by hot water or steam. In fact, the methods of piping glass houses are now almost identical in both systems. In either case the heat is carried from the furnace through one main pipe or riser which passes through the house near the top. From this riser as many returns are taken as are necessary, and the steam or water is returned to the boiler underneath the benches. About the only difference in piping for steam and hot water lies in a little more careful grading of the pipes for hot water, and the highest point in the hot water riser is usually at the further end of the house, while the highest point in the steam riser is approximately over the furnace. These systems of heating introduce a new principle into the method of forcing

plants; a part of the heat is applied above the plants rather than being entirely applied as bottom heat, as formerly. This of itself presents some advantages. It allows of greater uniformity in the temperature of the house, in proportion to the extent of heating surface, because it supplies some heat near the glass where the greatest radiation takes place. The piping under the benches is so much in excess of that above them, that good bottom heat is secured.

The common question now among greenhouse men is, which is better, steam or hot water? A Yankee would reply by asking the question what is meant by hot-water heating? If the old system of hot-water heating is meant, then I should say unhesitatingly that steam is better. But if the questioner has in mind the more modern and improved methods of hot-water heating, then I should prefer not to answer for all cases. It is undoubtedly true that for small houses the modern hot-water system is the better; and it may be that it is better in all cases. For myself, however, I have preferred steam, and I am using it in my houses. I have no doubt that the ideal system of heating is going to be a combination of steam and hot water. In other words, the ideal system will use steam whenever or wherever steam is found to be better, and it will use hot water in the same apparatus whenever hot water is better, as in mild weather. In fact, most of our steam plants can be used almost equally well for hot water. Let us suppose that we have a low pressure steam heater and that our house is piped for ordinary steam heating. When running with steam, we simply keep the water low in the furnace, so that there is room above the water for the storage of steam. If, now, upon any day I wish to heat with hot water, I simply fill my furnace full of water and run my plant as before. The expansion of the water by heat will force it through the pipes as if it were steam. There are but two or three matters of detail which demand attention. Some provision must be made for the expansion of water beyond the capacity of boiler and pipes. This expansion is provided for by simply taking out of the riser or return near the boiler a three-fourths-inch gas-pipe and carrying up this pipe several feet into a tank. The higher the tank above the furnace, the greater will be the pressure upon the hot water and the hotter will the water become. Under a pressure of forty pounds, the water will reach a temperature of about 300 degrees, which is a higher temperature than is attained by steam under any ordinary pressure. A stop-cock, preferably a stop and waste, should be inserted in the small gas-pipe near its union with the main, in order to close the circuit when steam is used. If the boiler is supplied from water-works an expansion-tank is not necessary, unless the pressure is very great, for the water may be turned on permanently and expansion will simply back the water up into the water works system. In using the steam plant for hot-water heating, the safety valve must be fastened down to hold the water in. When steam is used again it is only necessary to draw off most of the water from the boiler and to close the cocks in the expansion-tank.

inch gas-pipes are probably the best size to use in heating glass houses, because they present a greater heating surface than any other pipe which can be economically used. That is, small pipes and more of them is a better system than few large pipes. A more even and economical distribution can be secured by their use.

In practice it is found that twenty feet is about the maximum profitable width for a forcing-house. If a low house is desired, for forcing Radishes, Lettuce or other low plants, a much narrower house is advisable, unless it can be built upon a slope, where a two-thirds span can be used. Very narrow houses contain so small a body of air that the temperature is more difficult to regulate than in a wider house. The house should be low. The sides range from two to five feet, and the gable stands from seven to twelve feet above the surface in our best modern forcing-houses. The glazing is done upon permanent sash-bars, as more light can be secured by this method than by roofing with sash. The details of construction must be adapted to individual circumstances; but the old bugbear of great expense may be dismissed. I have built two good houses, each twenty by sixty feet, inside measure, at a combined cost of building, including heat, of about \$1,500. And these houses are much better than common commercial forcing-houses, which can be built much cheaper than this.

In conclusion, it may be said that there are six general essentials to successful forcing of plants: (1) Bottom heat. (2) Abundance of light. (3) Proximity of plants to glass. (4) Fresh air. We must outgrow the notion that we ventilate simply to cool off the house. The primary object of ventilation is to give fresh air, and this should be secured without allowing drafts upon plants or changing the temperature of

the house suddenly. (5) Humidity of atmosphere. (6) Adaptation of methods to change of habits in plants. Plants rarely, if ever, maintain the same habit of growth when forced as they naturally possess out-of-doors. The struggle for light is the chief cause of change of habit. It is the adaptation of methods to this change in habit and rapidity of growth which largely determines the good gardener.

THE CLEMATIS DISEASE.

A most valuable paper was one by Professor Comstock, of Cornell University, explaining the cause of the fatal Clematis disease, which has so long baffled investigation. One nurseryman in Ohio estimates his loss last year from this disease at \$4,000, and the subject is so important that we reproduce the paper almost entire:

The more striking symptoms of this disease are (1) the leaves suddenly turn black; then (2) the vine dies down to a spot near the root that has a diseased appearance. Frequently, after a period of rest, the plant will take a fresh start, sending up a new shoot from the root. But the life of this growth is of short duration; for the plant that once dies down is doomed to perish soon. At first sight there are strong reasons for locating the seat of the disease in a limited section of the vine near the ground. This section has a diseased appearance; the plant dies down to this point; and later fresh shoots are sent out from below it as if the roots were healthy. It was doubtless these reasons that led Professor Arthur to look upon a fungus which he found in the plant at this point as the cause of the disease. But my studies of the past two years have convinced me that this fungus simply accompanies the disease, and that the cause of it is something very different. Every grower of Clematis has observed knotty growths of varying size upon the roots of some of the plants. It is in these knots, or galls, that the cause of the disease is to be found. If a gall be cut across and the section examined with a hand lens of moderately high power, there will be found embedded in the abnormal plant growth small, pear-shaped bodies of the same color as the cut surface of the root, but rendered easily visible by their smooth, polished surface. These pear-shaped bodies are found on careful examination to be sacs containing a large number of eggs. In fact, each sac is the body of a worm which has become greatly distended by the eggs which have been developed within it. It is these worms cankering the roots of the plants that cause the disease. And, as they multiply rapidly, when soil becomes infested by them the spread of the disease is terrible. I know nurserymen, who a few years ago produced Clematis plants by the tens of thousands, who have been forced to give up their production on account of this disease.

But more unfortunate than the serious injury caused by these worms to the Clematis, is the fact that they do not confine their attacks to this plant. A very large number of species are liable to be attacked by them, and consequently the trouble cannot be overcome by simply suspending the production of this one plant. It is a question in which every horticulturist, whatever he produces, is interested. It seems as if the horticulturist was fated to ever have new battles to fight. He became thoroughly aroused long ago to the warfare against insects; somewhat later he awoke to the appreciation of the importance of plant disease caused by fungi, and now we find another group of animals much lower than insects preying upon plants to a serious extent.

The animals in question are worms, belonging to the order known to zoölogists as the Nematodes, or thread-worms. The species of this order that have attracted the attention of gardeners abroad are commonly known as eel-worms. A good illustration of the order is the "vinegar eel," a minute creature often seen wriggling near the surface of vinegar. The majority of the species are, like the "vinegar eel," harmless, feeding upon dead or decaying vegetable matter. A few species attack growing plants. The best known of these to readers of the English journals is the one that causes ear-cockles in Wheat in England, and the tulip-root of Oats in the same country; but more important than either of these is the species that infests the Sugar Beet in Germany. That species and the one infesting Clematis are closely allied, and differ from other forms in the body of the female being pear-shaped, as already described above; but the two species differ in that the one infesting Sugar Beet does not cause the plant to form galls like that infesting Clematis.

Both sexes of this species when young are very minute, requiring a high power of the microscope to detect them, and are thread-like in form. They can crawl very rapidly, and it is in this stage that the species is spread from plant to plant. The males undergo some remarkable changes, but are always

more or less thread-like. The females, after finding lodging places in the tissues of the roots and becoming fertilized, become distended in a remarkable manner, assuming the pear shape already described, and becoming of sufficient size to be seen by means of a simple lens.

The range of plants infested by this species of Heterodera is very great. It is already known to attack at least seventy-five species of plants belonging to widely different orders. It is found in diseased roots of Roses; it is very common in Begonias; it does a good deal of injury to Cucumbers, Potatoes and Tomatoes. In the south it is especially destructive to Peach, Grape and garden vegetables, including Cabbage, Turnip, Lettuce, Beet, Parsnip, Egg-plant and Melon. This wide range of food plants is the most discouraging element in the treatment of this disease. In fact, I do not feel that we are in condition to name with any great degree of certainty any plant on which the worms cannot live. In this direction lies an important field for future experiments. When such plants have been determined, the cultivation of them on infested ground, and thus starving the worms out, will be the most practicable way of meeting the evil in the case of field crops.

A German writer, Professor Kuehn, strongly urges the use of what he terms catch-plants against the species that infests Sugar Beet. He has used Rape as a catch-plant. This is sown on infested fields; the young worms in the soil penetrate the roots of the plants. After the roots have become infested, but before the females have begun to produce young, the plants are pulled up and destroyed. In this way several crops of Rape are produced upon the infested field one after another in the same season, each succeeding crop tending to entrap the worms remaining in the soil. But, obviously, the use of catch-plants is a very expensive method of fighting the pests, and yet it is an expense that would be gladly met by the owners of valuable lands if they could feel sure of such results as these reported by Professor Kuehn. Still I think we are hardly ready yet to give definite directions for the use of such plants. It seems to me, however, that the growers of Clematis can at once, without waiting for further discoveries, reduce their losses to the minimum by a little care in the management of their plant-houses, in the procuring of potting soil and in the choice of fields for planting out.

The conditions in some of our establishments where Clematis is grown are those most favorable for the multiplication and perpetuation of the disease. The benches upon which the pots stand are covered with gravel or coal ashes, which is changed at infrequent intervals; the roots of the diseased plants pass through the hole in the bottom of the pot and ramify in the gravel or ashes, and the worms follow the roots, infest them, and this soil becomes a breeding place for the pest. When another lot of plants is placed upon such soil, obviously in a short time these plants will become diseased. It is recommended, therefore, that between each two lots of plants the soil be carefully removed from the benches and placed where it will not contaminate other crops; that before renewing the soil the benches be thoroughly washed with lye so as to destroy any worms that may be lodged in the cracks; that the soil for potting be carefully selected so that it shall not be a source of infection; that in planting out great care be taken to make sure that it be done on land which is free from this worm; if any roots of any kind are found in the soil which have unnatural swellings upon them, the field should not be used, as there will be a strong probability that such swellings are galls made by this worm; and finally, until a grower is able to produce only healthy plants he should not use root-grafts, for roots that are apparently healthy often contain the worms.

THE EMBELLISHMENT OF PUBLIC PLEASURE-GROUNDS.

The paper on this subject, by Mr. William McMillan, Superintendent of the Buffalo parks, was one of substantial merit, and its value was made so clear by impressive delivery that the effect on the audience was striking. After speaking of the necessity of having a consistent plan, Mr. McMillan insisted upon thoroughness of construction; everything should be of the most durable character, since the admission of makeshift and temporary work always proves costly in the end on account of the greater cost of maintenance. In a consistent plan all features will not only be in proper harmony with each other, but nothing will be introduced that cannot under ordinary municipal conditions be easily maintained in good condition at all times. For instance, the location, width and alignment of drives and paths will combine to the best advantage, gracefulness of proportion and convenience in use. The sinuosity of a walk, if unnecessary or unnatural, will surely tempt pedestrians to make a cross-cut track at every

bend. This will not only disfigure the grounds, but encourage disorderly usages that will gradually lead to other encroachments, until the original design be obliterated and its ornamental value be utterly lost. For similar reasons, the more ambitious or pretentious any decorative feature may be, the greater the risk of incidental damage that will make it a mockery of the motive with which it was introduced. Whatever general type or special feature of embellishment may be desirable, the measure with which it can be fittingly maintained will be the best gauge of what may wisely be attempted. This measure will be of a different standard for public grounds from that current in well-kept private gardens. The conditions differ more widely than is generally believed. Private grounds are almost wholly free from a large class of petty trespasses that are the constant accompaniment of public use or occupation. Park policemen may be appointed to prevent such damage and to secure orderly behavior, but in practice they are often an expensive luxury more ornamental than useful. Trespasses that in the aggregate may be fatal to all decent management, taken singly may seem so petty as to be unworthy of notice. Stepping on forbidden grass, dodging out and in through bushy thickets, breaking twigs, picking flowers, peeling saplings, girdling Birch-trees, carving Beech-trunks, even downright stealing of small plants, or their wanton destruction, may be of daily occurrence without detection, or, if detected and gentle reproof be unheeded, sterner action will be resented and arrest be worse than useless. Take a flagrant case to court, and the plausible lies and special pleading that will be heard and believed will make the misdemeanor seem too trivial to occupy the time of the court.

Those untoward conditions make it prudent not to indulge freely in showy or costly ornamentation. Take, for example, the culture of Azaleas or Rhododendrons. When they are in bloom the temptation seems too strong for the average park visitor. They will be despoiled at every favorable opportunity, and soon the plants will be entirely destroyed, as from two to three years' growth of twig will go with every flower-truss that is plucked. Natural conditions of soil and situation suggest a sheltered and shady location, but there the risk of depredation is greatest. Constant police supervision is impracticable, and the safest place will be the most exposed and frequented; but there you must fight against sun and wind, drought and frost. Of the two evils you may choose the less, but only to meet constant vexation and disappointment and final failure.

After explaining why a formal and artificial scheme of planting may be the most effective in small city squares, Mr. McMillan argued against the use of trees and plants with highly colored foliage, where broad effects were aimed at, as unduly exalting the abnormal above the normal, the rare-freak above the common type. It is surely false to Nature to do so, or to run to excess in the display of strange colors, however natural the tints may be. Nature is always temperate in the display of high color. The rainbow is evanescent. Dew-drops sparkle only at a certain angle of vision, and soon evaporate. A gorgeous sunset covers but a small part of the heavens, and lasts but a few minutes, and the exhibition is not opened daily or even weekly. For a week or so in autumn there is a brilliant display of colors in the foliage of trees and shrubs; but the duration of the brightest tints in any leaf is very brief, and the whole display is but "a fleeting show." Because we can admire these changing colors so much for a brief period as the foliage ripens, it does not follow that we could enjoy the display with equal relish if exhibited during the whole season of active vegetation. As a daily diet, it would surely satiate, and even nauseate, the most hungry appetite for high color.

Mr. McMillan's paper contained many other valuable suggestions, to some of which we shall refer in the future.

Recent tests indicate that London Purple may be more dangerous to foliage when used in spraying than Paris Green, because it sometimes contains more soluble arsenic.

In Chautauqua County 8,000 tons of grapes were produced last year, which, at so low a price as three cents a pound, were worth nearly half a million dollars. In Yates County 7,500 tons were produced.

Hyposulphite of Soda, though not a perfect remedy for the scab of Apples or Pears, is still the best that is known, and when a mixture of half an ounce to ten gallons of water is used it will destroy a large proportion of the fungus.

The high price of sugar materially lessened the demand for many kinds of fruit during the last season. This was particularly true of Currants, but the price of Strawberries was also

affected because the preservers used comparatively few of them.

It was generally held that an orchard of Dwarf Pears is more profitable than one of standard trees. Dwarf trees had proved long-lived, yielded as good if not superior fruit, were less susceptible to blight and bore more regularly. Dwarf Pears could be planted on heavier soil—indeed they should not be planted on light, sandy ground, which is not naturally adapted to the Quince root. The Duchess had heretofore been used almost exclusively as a dwarf, but the Kieffer was now largely worked on dwarf stock, and the Anjou and Howell were named as varieties especially adapted to this treatment. One orchard of four and a half acres yielded 441 barrels of Duchess pears last season, which brought \$1,906. The practice is to cut back severely every year and fertilize heavily.

The movement in favor of fruit-growers' institutes was commended because, it was argued, this industry was quite as important as others in which instruction was provided by the state. If dairy institutes are held in the grazing districts of the state to the advantage of butter-makers, cheese-makers and milk-producers, there is equal reason to suppose that local meetings for discussion in the fruit-growing districts at which experts in various branches of fruit-culture could read papers, would prove helpful. If it is essential to weed out from the dairies of the state unprofitable breeds of cattle, it is quite as important to discard unprofitable varieties of fruit. The average yield of apples in the state is less than one barrel to the tree, and individual trees under the best conditions have borne ten barrels and even more than twice ten barrels, according to the veteran Major H. T. Brooks.

Notes.

Trailing Arbutus was found, last week, in full bloom, in two places in the neighborhood of Mays Landing, New Jersey.

As evidence of the advanced state of the season in South Carolina, Dr. Mellichamp sends us a branch of the old *Morus multicaulis*, gathered on the 18th of January, with expanded flowers and full grown leaves.

A European correspondent, who has traveled in Ceylon, calls our attention to the fact that a plant mentioned in a notice of an article from *Macmillan's Magazine* on "Weeds" on page 611 of our last volume is not, as the English writer supposed, the blue-flowered *Ageratum*, but *Lantana curavatica*.

A correspondent from Minnesota writes that a Tamarac tree (*Larix Americana*) has lately been found which measured seven feet eight inches in circumference four feet above the ground, and was estimated to be 125 feet high. The largest Cedar (*Thuja occidentalis*), observed by the same correspondent, measured ten feet four inches in circumference at four feet above the ground, and was about seventy feet high. Both these trees grow near a brook of constant spring water, and in alluvial soil, rather stony.

A monster Elm-tree stands on the Avery Durfee farm in Wayne County, New York, between Palmyra and Marion. Two feet above the ground it measures thirty-three feet ten inches in circumference, and five feet above the ground twenty feet and ten inches. It is sixty feet to the first limb and the total amount of lumber in the body of the tree is 16,250 feet. Eighty years ago, when the farm was cleared, this tree was left as a landmark. It was then a giant among the surrounding forest trees.

About 20,000,000 pounds of prunes are annually produced in California, largely of the better quality, which are packed in fancy boxes like the high-grade French prunes. In our eastern cities the California fruit has sold, of late, in much larger quantities than the French, and at prices from three-quarters of a cent to one cent higher per pound. But between 60,000,000 and 70,000,000 pounds of inferior foreign prunes are annually imported, to be sold at very low prices to the laboring and mining population of all parts of the country.

According to the London *Times*, the largest market for Christmas-trees in Germany is Berlin, where, this season, 400,000 trees were sold, varying in height from two to thirty feet. At wholesale, the plants are bought by the *schock*—that is, in parcels of sixty, large and small ones being taken together as they come, at an average price of from about \$5 to \$5.50 per *schock*. At retail, trees not more than two feet high sell for twelve and a half cents. From seven to ten feet is the size most in demand, which brings from twenty-five to fifty cents, while twenty-foot specimens of fine quality bring \$2.50 or \$3. Almost all are Fir-trees, cut in the Hartz Mountains.

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NEW YORK, WEDNESDAY, FEBRUARY 5, 1890.

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It hardly needs to be said that the persons who appreciate landscape beauty, and who recognize the superiority of free natural treatment, or what is known as the park-like treatment of extensive public grounds, have as keen a relish for what is commendable in ornamental gardening as those who seem to consider it the only kind of gardening worthy of the name. Our belief is that the most refreshing antithesis to the hard lines of straight and stony streets shut in between high walls and to all the stress and pressure of city life is found in the freedom and openness of simple, broad, meadowy landscapes and spacious skies. And yet we have given illustrations of many formal gardens to show how effective they may be where skillfully planned and adapted to their surroundings. Fit fields for work of this sort are offered in most of our cities in connection with public buildings and elsewhere. Along Riverside Drive, in this city, where the foreground is limited by the parapet, there is ample opportunity within this line for ornate embellishment, statues, fountains and floral embroidery, and all this would not detract from the impressiveness of the prospect across the strong and silent river, with the forest-crowned cliffs and noble sky-line beyond. This means that while we would exclude ornamental gardening from places where it cannot be displayed to best advantage, and where it would clash with the design of other works, it is

altogether proper that adequate provision should be made for it in appropriate places at public cost.

In speaking of both these types of gardening-art, we have referred of course to genuine art and not to any spurious imitation or substitute for it. Only a master endowed with the creative faculty in ample measure could, with the material at hand—common grass, common shrubs and trees—work out a landscape so complete and satisfying as that in the Buffalo Park, the very strength of which is its simplicity. Almost as hard to find is an artist with the constructive talent and refined sense of color and form which will enable him to conceive and carry out a creditable design in strictly ornamental planting. When the writers who can see no beauty in a natural landscape, and insist upon higher color and more elaborate form in planting, will point out some satisfactory examples of this kind of work, or state with definiteness what it is they wish to substitute for the American flags and carpet-patterns and ribbon-lines now prevalent, they will command the gratitude of every one interested in garden-art.

There can be no doubt in the mind of any one who has given the most casual attention to forests and forest requirements that the productive capacity of any piece of woodland in this country can be increased by the application of a little common sense to its care, or that the wealth of the country can be increased enormously by the general introduction of wise systems of forest management. Men, or the great majority of them, who own woodland or forests will take care of them only when they can be made to realize that there is money in doing it, and not before. They must be made to understand that certain systems of culture must be applied to the care of land covered with trees as well as to land covered with other crops. Every authoritative word about our forests which is written or spoken with this object in view has its value. The strongest arguments are those based on facts like these in the following extract from a communication made by Mr. J. D. Lyman, of Exeter, New Hampshire, to the *American Cultivator*:

"The proper care and management of our Pine-forests must be in the line of experience and actual facts. Theory will not answer alone, nor are the writings of European foresters always safe guides in American practice. I will give you a few simple facts in illustration.

"I have in mind a clump of Pine-trees, which I remember from childhood, for it stands close by the burial-place of relatives of mine. An aunt of mine remembers these Pines in her childhood, and she was born in 1802. It is safe to say that they are 100 years of age. These Pines came up thick, and have never been thinned out, except as, in their struggle for existence, some have been so shut out from sunshine and crowded as to die. They are yet so small that I have never heard any one refer to these trees as being a clump of timber. They are tall and almost limbless, stunted, spindling trees, and I think very few of them one foot in diameter.

"In the winter of 1854-55 I bought a hundred-acre lot of land covered with a light deciduous growth, with small White Pines scattered among it. A very few years before the previous owners had cut out all the Pines large enough for small framing timber. It is well known that small trees are cut for this purpose. I paid \$600 for the lot, and was laughed at for giving so much. I commenced to cut Pine-timber upon this lot in the winter of 1862-63, and in five years had taken \$1,900 net from it. In 1870 I sold the remaining saw timber upon it for \$600 on the stump. This illustrates how rapidly scattering Pines will grow.

"In January, 1870, I bought a lot and cut the Pine upon it closer than I ever cut them for timber on any other lot. I cut trees not much over six inches in diameter. A gentleman rallied me about putting cord-wood in as logs. About four acres of very thick little Pines were left after cutting close as I have stated, and more or less Pines, so small as to escape even such close cutting, were left scattered over perhaps twenty acres. In 1873 or 1874 I commenced to have these little Pines thinned out. This thinning has gone on from time to time till the present. Much wood, shingle-stuff and small timber has been cut out, all of which has paid well for cutting, so that the thinning has cost me nothing. And now my larger Pines on

this lot are much larger than the largest in the clump first referred to near the burial-place, though only about one-third as old. I think the Pines on this lot would to-day sell for from five to ten times as much as they would have sold for if they had not been thinned.

"These and many other instances convince me that it is very easy in many cases to increase the growth of timber some four-fold upon our lands, and have the thinnings which are cut out pay or more than pay all the expense of the necessary labor. On the second lot I have mentioned, the Pines were so scattered and the other growth so small that the Pines had got above the other trees and grew rapidly without aid. As a physician may kill with good medicine unwisely administered, so one may almost ruin his grove by injudicious thinning. I have seen such instances. Yet the proper thinning of thick young trees is of very great importance."

The Problem of Heather in North America.

FEW wild plants in the British Islands and on the continent of Europe are more attractive to American visitors than the very common Heath or "Heather" (*Calluna vulgaris*). The moors of the north are brightened by its color, and there seems to be no end to the prodigality with which Nature has scattered in barren places these clusters of delicate foliage and far more delicate blossoms. To the dwellers on the edges of the wastes carpeted by Heather the plant is hardly more than a hold-fast to bind down drifting sands, since sheep and cattle do not willingly use it as food. And it is not unlikely that much amusement has been caused by the expressions of delight which have fallen from the lips of Americans who have seen for the first time Heather in profusion. Although the present writer has many times seen Heather, and perhaps enough of it, in different parts of Europe, the sight of the plant when bound together as stable-brooms or used as bedding for cattle has never ceased to appear as a sort of an indignity against which he ought to remonstrate.

The reason for this feeling on the part of Americans is plain enough. In the first place, the plant is pretty, despite its commonness everywhere in the old world, and, in the second place, it does not grow, and cannot be made to grow, "wild" in our own country. Here and there, as we shall see presently, it has been found in small amount, but it has had only a precarious hold upon the soil, with no assurance that at any place as yet unvisited our botanists will find it well established.

This lack of Heather here seems all the more strange when we remember that the climate of the north temperate zone is substantially the same here as on the other side of the Atlantic. Making all allowance for the differences produced by the influence of the Gulf Stream, which gives to the west coast of Europe a warmer climate than we enjoy at the same latitude, it is hard to see why this plant, so common there, should be wanting here. We must ask, if at one time it covered the northern hemisphere, where has our share of it gone, and if it never was here at all, why does it not invade our territory, as so many of the other common plants of Europe have done, and which we call weeds? In the last century the great Linnaeus wrote that two plants threatened by their spread to cover the whole earth—namely, Tobacco and common Heather. Tobacco has made pretty good progress, but so far as Heather is concerned his prophecy has not been in any marked degree fulfilled.

So far as the Heath family, as a whole, is concerned, we may say that in our country we have a fair share, but that of the true Heaths themselves we have practically none at all. At Nantucket two species have been found, but in such small amount and under such circumstances that no one thinks of regarding them as native plants.

The true Heather (*Calluna vulgaris*) was early reported as occurring in Newfoundland, but Mr. Charles J. Sprague, who investigated the evidence upon which one of the citations rested, was forced to decide against its authenticity. Other localities have, however, been found since, both in Newfoundland and in the Provinces of New Brunswick and Nova Scotia, but in all instances the space covered in each locality has been reported as rather small, and in a few of the cases there was strong suspicion that the plants had been introduced by man.

In July, 1861, Mr. Jackson Dawson exhibited at one of the weekly meetings of the Massachusetts Horticultural Society a plant of Scotch Heather, which he had labeled "Native Heath, found growing wild within twenty miles of Boston." A committee of the Society made a careful examination of the locality. From their report communicated to the *American Journal of Science*, January, 1862, p. 22, a few facts are here-with given. The plants grew over about half an acre of

even pasture-land, which was covered by a close, short grass, and interspersed with numerous plants of Sheep-laurel, Hardhack, Cassandra, Sweet Gale, Cranberry and a few Alders. There were twenty or more old plants and a multitude of seedlings springing from the peaty soil, mixed with sand, which was well adapted to the cultivation of any Heaths. The earth was kept moist by a brook running through the meadow, and here the plants flourished. A thorough investigation of all the circumstances connected with the growth of the plants showed that it was extremely improbable that they had come from seed sown by man, and the committee concluded that the plants were indigenous. Professor Gray visited the locality in September in company with a member of the committee, and he, likewise, came to the conclusion that the plants were native.

Subsequently a small locality was detected in the neighboring town of Andover and another in Cape Elizabeth, Maine.

Somewhat over a year ago the writer had the pleasure of visiting the Tewksbury locality in company with one of our most assiduous devotees of botany, Mr. Walter Deane, of Cambridge. At the dwelling-house nearest the locality we obtained explicit directions as to the exact spot, and we walked with confidence, expecting to see that the Heather had perhaps spread over a larger area in the twenty-seven years that had elapsed since Dr. Gray's visit. On the way to the brook we saw a vigorous clump of Heather, which had evidently been transplanted from the larger locality, and this removed any doubt we might have entertained as to finding the original place. Our utter discomfiture can therefore be realized when it is stated that we hunted high and low, up the brook and down the brook, and even far into a neighboring young forest, without detecting a trace of the plant. We were both rather accustomed to hunt for rare plants, and did not feel inclined to give up the search easily, but at last we were forced to return to the house for further instructions. Here we learned that we had been indeed in the right place, and, to prove this, the owner of the land went with us to point it out. On reaching the place with us he walked back and forth through the Alder-bushes, and at last declared that he could not account for its disappearance. To be sure, the place had been visited by many persons who had carried away reasonably large specimens for transplanting, but this would not explain the utter extermination. A few straggling, "drawn," prostrate and dying specimens were finally found, but they were only mere shadows. All that we could do was to make a pecuniary arrangement with the owner to clear away the overshadowing Alders and other young shrubs, and give the remnant a chance. But the chance appeared to be indeed a very small one, hardly worth even a day's labor. Such seems to be the history of about all the localities of Heather known to us in this country. For instance, a well-established locality discovered by the writer a few years ago on the line of the Maine Central Railroad, in Westbrook, Maine, and known to a few members of the Portland Society of Natural History, has been entirely lost by fires along the track. Some of the stations in the provinces have held on rather better, but the plants do not appear in any case to spread over more ground. Uncared for, the plants are speedily crowded out by more vigorous contestants for the space, and they give up the unequal struggle.

Late in the summer of 1888, I received some excellent specimens of Heather from a lady living in Townsend, Massachusetts, a town near the New Hampshire line. I have visited this locality twice, in company with other botanists, and on the last occasion accurate measurements of the area covered by the plant were made. Without giving details, it will suffice now to state that considerably more than an acre of ground was found well filled with healthy, strong plants, and that there was every indication of their being in full possession. The only rivals were the low bushes, common in what is everywhere known in New England as a Blueberry-pasture. The sandy soil had a few strong Cranberry-vines, but against these and the grass-like plants the Heather was evidently making its way. There were also a few plants of species of *Viburnum* and *Cornus* as well as of those seen in the Tewksbury station, but they did not appear threatening, nor did the one or two trees. The Heather was spreading into adjacent fields and even invading the woods near by. In short, the locality impressed all who examined it as one likely to be long preserved.

The question is again brought before us, by this new and strong station, as to the relations of this plant to our flora. The proximity of the station to that in Tewksbury and the lost one in Andover, suggested that the three might be the fading traces of a general occupation of a large area. It was with a measure of disappointment that the information was received which emptied this suggestion of all its value. Upon learning

that there was a good degree of interest in the matter, the owner of the land said that he could tell us how the plant came there. About the time of the Franco-Prussian war, his sister-in-law visited the north of Ireland and brought back as a souvenir a few sprays of Heather from her old home. In the box holding these dry sprays were some seeds which it was suggested should be sown near the homestead in Townsend, but it was finally decided that the Cranberry-pasture would give the seeds a better opportunity for growth. Here the seeds were sown and the rapid growth had taken place in the period of sixteen years which had elapsed. In the pasture the browsing and grazing animals had kept down the competitors of the Heather, and with the happiest results. The moisture of the land was enough to provide for the plants the water which, in the Old World, they get from the humidity of the atmosphere over the moors (that is, the moisture in the air, condensing on the plants, must make partly good the lack of moisture in even the dry sand there), and so the Townsend Heather had kept its place.

There would seem then to be much encouragement in these facts for our dwellers in country homes. Given a barren pasture with a fair amount of moisture in the soil, and given, also, some means of keeping down the shrubs which would crowd the Heather out, the plants will have a fair chance of surviving. It seems possible that many of our country and even our seaside pastures may be made attractive in this way, at least the experiment is so promising that it should be fairly tried.

While, therefore, I believe that with a little help in keeping its competitors under, Heather may be made to thrive under conditions easily attainable here, I can no longer believe that the scattered stations of Heather now existing in the provinces, and, more rarely, in New England, date farther back than the accidental or intentional scattering of Heather-seeds by the hand of man.

We have, in such a study of Heather in a New England pasture, a capital illustration of the paucity of simple facts at one's command. What we do know, is the following: A common plant, wild in a soil and in a climate much like our own, refuses, under the ordinary conditions of the struggle for existence, to make even a pretense of holding its ground when it comes here. What no one knows, is the following: Whether the conditions here, of heat and cold, dryness and moisture, insect visitants, competing shrubs and herbs, grazing animals, and the like, are so nearly favorable that with a trifling change, one way or the other, they might serve the plant well and give it here an open welcome. Careful observation of a few plants of Heather, left to themselves in different localities in New England or the middle states, might settle some of these points which otherwise must be left, as now, to mere conjecture.

George Lincoln Goodale.

Cambridge, Mass.

New or Little Known Plants.

Picea Breweriana.

WE are indebted to Mr. J. G. Lemmon, the botanist of the California Board of Forestry, for the photographs from which the illustrations of this California Spruce on pages 66 and 67 have been prepared. *Picea Breweriana** is the most local of all the Spruces and perhaps from its peculiar habit of growth one of the most remarkable of them all. It was not noticed until 1884, when Mr. Thomas J. Howell, of Arthur, Oregon, found it on the north slope of the Siskiyou Mountains near the head waters of the Illinois River, in the extreme northern part of California. It was seen later by Mr. T. S. Brandegee (who obtained a trunk of this tree for the Jesup collection in the American Museum of Natural History in this city), a little to the south of Howell's locality on one of the small north forks of the Klamath. These are the only stations known for this remarkable tree, and there are hardly a hundred fully grown individuals in them both, although it will be found, doubtless, on some of the adjacent ridges or mountain-ranges; for all that part of California lying west of Mount Shasta, one of the most broken and rugged parts of the state, is still very imperfectly known and its botany is practically unexplored. Mr. Brandegee found the few trees which he saw, widely scattered over an area of several hundred acres, growing with the Douglas Fir, the Sugar

*Watson in *Proc. Am. Acad.*, n. ser. XII, 378. Sargent in *Gardeners' Chronicle*, n. ser. XXV, 493, f. 93.

Pine, the White Fir (*Abies concolor*) and a few small specimens of Lawson's Cypress which, previous to that time, was not known except in the single locality discovered by Jeffrey on the head waters of the Sacramento below Mount Shasta and on the Oregon coast.

Picea Breweriana differs from the other American Spruces by its blunt, round leaves and by its larger cones, whose thin, entire scales resemble somewhat those of the White Spruce; they are much larger, however, and sometimes almost as large as those of the Norway Spruce, which this tree resembles, too, in the form of the leaves and in its long pendulous branchlets. These long branches, one of which, very much reduced of course, appears in figure 16, are the marked and striking feature of this tree. They are six or eight feet long sometimes, thin and flexible as a whip lash, and "give to the trees," to use Mr. Brandegee's expression, "the appearance of Weeping Willows." The cones, instead of appearing near the top of the trees as they do in the other American Spruces, are produced from the lower branches also, as in the Norway Spruce, and hang down from the ends of the long pendulous branchlets. The largest tree measured by Mr. Brandegee was ninety feet high, with a trunk diameter of thirty inches.

Neither Howell, nor Brandegee, nor Lemmon, the only botanists who have ever seen, apparently, *Picea Breweriana*, visited the trees at seasons of the year when seeds were ripe, and this species has not been introduced yet into cultivation. *Picea Breweriana*, if it is fair to judge from the habit in cultivation of several other California trees which grow naturally only in small numbers and in very narrow areas—*Cupressus macrocarpa*, *Pinus insignis*, *Pinus Torreyana*, *Chamaecyparis Lawsoniana*—may be expected to adapt itself to conditions very dissimilar to those in which it is found on the Siskiyou Mountains and to thrive outside the limits of its present restricted range. If this expectation is confirmed and *Picea Breweriana* assumes in cultivation anything like its normal habit of growth, it will certainly prove one of the most striking and attractive American conifers and a garden ornament of first-rate value.

The specific name adopted by Mr. Watson for this tree commemorates the services, in California, of Professor William H. Brewer, of Yale College, who, more than any man in his generation, has brought to light by explorations in the forest the characters and distribution of the Pacific coast conifers.

C. S. S.

Foreign Correspondence.

London Letter.

TWO new Irises are now flowering for the first time at Kew; they are *I. Bakeriana*, a near ally if not a variety of *I. reticulata*, which it resembles in habit, size and form of flower, but differs most markedly in color from the known forms of that species, and is superior to them all. It is pale blue, with white falls spotted and blotched with rich black velvety purple. At Kew it thrives under the same treatment as *I. reticulata*. The second one is *I. Bornmulleri*, an Armenian species introduced last year by Max Leichtlin. Its habit is that of *I. Persica*; the flowers are medium in size, and colored a deep canary yellow, with a few brown spots on the outer segments and slightly bearded. The inner segments are unusually narrow and small for an Iris. Close to these two Irises is the bed of spring flowering Crocuses, many of which are in full bloom already. Lately the weather here has been quite spring-like. On Sunday, the eighteenth, for instance, the thermometer stood about sixty all day, and the sun shone as brightly as in May. The mildness of the weather so early in the year is almost certain to have disastrous consequences. *Lonicera Standishii* and *Hamamelis arborea* are in full bloom, the former a white flowered, very fragrant and free blooming plant of semi-scandent habit; the latter a beautiful shrub, with its twiggy branches thickly clothed with bright golden flowers.

NEPENTHES.—A collection of pitchers of these plants, just shown by Messrs. Veitch, was, perhaps, the most interesting exhibit of the first meeting of the Royal Horticultural Society. The pick of this fine collection are *N. Curtisii*, *N. hirsuta*, *N. Northiana*, *N. Rafflesiana* and *N. sanguinea*. Many hybrids were shown, the best of them being *N. Mastersiana*, *N.*

Dicksoniana, *N. Morganæ* and *N. Chelsoni*. As a rule, the hybrids are very much easier to cultivate than the species. Probably the very best garden plant in all the lot is *N. Mastersiana*, raised by Messrs. Veitch from *N. sanguinea* and *N. distillatoria*, and grown by them into really marvelous specimens.

Hippeastrum aulicum, var. Prince Albert, is an old Chatsworth favorite, and certainly the best of the several forms known of this fine plant. Flowering at this time of the year, this species is of special value, and it is one of the easiest to manage of all *Hippeastrums*. The flowers are large and colored deep crimson, strong bulbs producing scapes two feet high, bearing three or four flowers. *Dendrobium Macfarlanei*, shown by Messrs. Veitch, is a new introduction from Torres Straits, with the pseudo-bulbs and foliage of its geographical neighbor, *D. superbiens*, whilst the flowers, almost as large as those of *D. formosum*, are snow white. The petals and sepals are rhomboid, two inches long, the lip being almost as long, with two acute folding lateral lobes, bearing a few streaks of purple.

DENDROBIUM HYBRIDS.—These are becoming abundant in English gardens, and, unfortunately, some of them differ from each other only in name, while not a few are inferior to the commonest species. A hybrid should be a distinct gain, or it should be destroyed. Of course there are hybrid *Dendrobiums* which are both distinct and beautiful; such, for instance, are *D. Ainsworthii*, and *D. splendidissimum*, var. *grandiflorum*, the latter, however, very unfortunate in having a ridiculous name. Sir Trevor Lawrence exhibited at the meeting of the Royal Horticultural Society, held on Tuesday last, the following hybrid *Dendrobiums*: *D. Luna* (*Ainsworthii* × *Findlayanum*), like the last-named parent in habit and in the size of the flowers, but having creamy-white segments with purple tips, a large lip with a few purple lines in the throat, and a tinge of yellow in front. It scarcely differs from *D. chrysodiscus*, a hybrid raised from the same parents, and it is slightly better than *D. xanthocentrum*, which was obtained from *D. Findlayanum* × *D. Wardianum*. This has large flowers like those of the last-named parent, but the lip is large, flat and yellow in the middle, as in *D. Findlayanum*. *D. Juno* (*Wardianum* × *moniliforme*) is simply a good *D. nobile*, with the addition of a tinge of yellow on the labellum. *D. chlorostele*, from the same parents, scarcely differs from *D. Juno*. The finest of the lot was *D. splendidissimum grandiflorum* (*aureum* × *nobile*), which flowered for the first time some ten years ago. The flowers are over four inches across, of good substance, and like a gigantic *D. Wardianum*, except in the lip, which is shaped like that of *D. aureum*, but larger, and colored rich velvety purple, margined with white. This hybrid is remarkable on account of its exceeding both parents in size. *D. enosmum* (*endocharis nobile*), and its variety, *leucopterum*, have elegant large fragrant flowers, the variety especially being a charming Orchid, pure white, with a rich maroon-colored lip.

D. nobile, grandest of the race, beautiful even in its worst form, a perfectly tractable garden plant, and possessed of endless variety in form and shade, was represented by some rare forms from the collection of Sir Trevor Lawrence. These were *D. Cooksoni*, the three-lipped *Dendrobium*, its three inner segments, or petals, being alike in size and color, the lowest one being less spreading than the others; it is an interesting and beautiful Orchid. The Burford Lodge variety is even more interesting morphologically, as the characters which normally belong only to the lip occur also on the lower half of the two lateral sepals. *D. Tolliana* is a curious monster, the flowers being inverted so that the lip is uppermost; the petals are broad and less spreading than is usual in the species. If we add to these the grand varieties known as *nobilis*, *Sanderianum*, *pendulum*, *Wallichianum*, etc., every one as easy to manage as the commonest form of *D. nobile*, the value of this species in gardens is plainly seen. *Dendrobiums* are not general favorites; a few, such as the above, *D. fimbriatum*, *D. formosum*, *D. thyrsiflorum* and *D. Dalhousianum*, are popular, but there are dozens of first-rate garden plants in the genus besides these, and many of them are just as easy to manage. The species in bloom now at Kew are *D. Wardianum*, *D. nobile*, *D. speciosum*, *D. moniliforme*, *D. Ainsworthii* × and *D. formosum*.

MEXICAN LÆLIAS.—The gayest Orchids in flower now are such Lælias as *L. anceps* in many varieties, *L. albida*, *L. furfuracea*, *L. Gouldiana* and *L. Crawshayana*. Better acquaintance with these plants makes it clear that, as in the many forms of *Cattleya labiata*, which once ranked as species, as in the case of these Mexican Lælias, there are more species recognized than can be easily maintained. The link connecting *L. albida* with *L. anceps* is the rare *L. Crawshayana*, called

a natural hybrid, but probably merely the link needed to unite these two extremes under one heteromorphous species. The same remark applies to the newer *L. Gouldiana*, which connects *L. autumnalis* with *L. furfuracea*. Of course nature is not concerned in making species and keeping them distinct; one might easily proceed from this to argue that every genus is merely one variable species of more or less range. We must believe that all the species in a genus have sprung from one, pretty much as all Cabbages are from *Brassica oleracea* and all Chrysanthemums from *C. morifolium* (*Sinense*). At any rate, the term natural hybrid for a plant with a fixed and distinct character seems to me lame. Talk about names merely is, however, an unprofitable game, for a gardener at any rate. If I could have my way plant names should be fewer in number and very much simpler than many of them are now. The man who saddles plants with names like *Damnacanthus*, *Catoblastus*, or *Swammerdamia*, is guilty of something akin to felony.

MIDWINTER CHRYSANTHEMUMS.—These are useful, and efforts are being made by the National Chrysanthemum Society to encourage their production and culture. A paper read this week at a conference of this Society recommended the following as possessing the qualities most essential, namely, lateness in blooming, which must, of course, be inherent and not the result of special treatment; secondly, freeness of habit and convenience of size; and thirdly, good, well-colored, freely produced flowers—*Etoile du Midi*, *Kämpfer*, *M. C. Hubert*, *Meg Merriles*, *Ralph Brocklebank*, *Countess of Lytton*, *Ceres*, *Mrs. C. Carey*, *Ethel*, *Thunberg*, *Boule d'Or*, *Moonlight*, *Gloriosum*, *Mrs. H. Cannell*, *Golden Gem*, *Boule de Neige*, *Snowdrop* and *Mdlle. Sentir*. These, according to the author of the paper, do not begin to bloom before the beginning of December, and they remain in beauty at least until the middle of January. He also recommends the following single flowered kinds as possessing the same qualities, namely, *Magenta King*, *Canariense*, *Brunette*, *Ellen Terry*, *Mrs. Killock*, *Monte Carlo* and *Gus Harris*. Other late flowering kinds deserving of special mention are *Kioto*, *Lord Eversley*, *Moonlight* and *Maggie Mitchel*. The treatment recommended for these late flowering kinds by an excellent grower here is as follows: Strike the cuttings in March or April, shade in hot sunny weather, and half plunge the pots in ashes. Do not house the plants until forced to do so by frost, and when under glass keep them as cool as possible. If the flowers are not pushing fast enough a little heat may be given in December.

London.

W. Watson.

Paris Letter.

IN spite of the cloudy and disagreeable weather which has prevailed this winter in central and southern Europe, Tea Roses, Narcissus and Australian Acacias from Provence are sold in our streets, with Violets, also from the south, of which an incalculable number of little bouquets are sold at prices varying from two to five cents each. Forced Lilacs, Lilies-of-the-Valley and Snowballs are the most common flowers in the florists' shops. The forced Lilacs have for many years been objects of considerable commercial importance in the French capital, and now the cultivation of Lilies-of-the-Valley becomes every year more and more extensive. The beauty of the flowers, their durability and the delicacy of their perfume make the Lily-of-the-Valley one of the favorite flowers here. The roots for forcing come from Belgium. Attempts to force those taken from the woods have never been very successful, and it is found necessary, in order to obtain good flowers, to subject the roots to preparatory cultivation in nurseries. It is estimated that about 1,500,000 roots of Lily-of-the-Valley are now forced every season in the neighborhood of Paris, and that the average annual sales of the flowers amount to half a million of francs.

Cyclamens, different species of Erica, the Clivias, and Chinese Primroses, Cinerarias, Hyacinths, Tulips and Epiphyllums appear also in the windows of the florists.

At the last meeting of the National Society of Horticulture, M. J. Sallier, of Sceaux, exhibited a fine specimen of *Luculia gratissima*. This superb shrub belongs to the *Rubiaceæ*. It is a native of Nepaul, and therefore should be cultivated in the cold house. The rose-carmine flowers are extremely and delicately fragrant, and are united in great terminal corymbs. Like so many other plants, *Luculia gratissima* was fashionable at one time, and then its cultivation was abandoned without any apparent reason. The world has its caprices, but it does no harm to call attention from time to time to neglected plants often difficult to obtain, although, fortunately, they still exist in the great botanical gardens. M. Sallier exhibited also *Cypripedium chloroneurum*, a hybrid, whose parentage is unknown.

It has the foliage of *C. venustum*, and great brilliant flowers, looking as if they had been covered with a coat of varnish, and *C. Enanthum*, a hybrid between *C. Harrisianum*, crossed by *C. insigne Maulei*. The foliage of this plant is dark green. The peduncle is covered with black hairs, and bears a solitary flower, whose superior sepal is greenish white, with numerous violet veins, the petals and lip being vinous violet. M. Chantrier, of Bayonne, exhibited seedling Chrysanthemums; M. Driger, a *Cælogyne*, introduced directly from Burmah; Vilmorin & Co., an interesting variety of *Calceolaria*, obtained by crossing *C. rugosa* with a herbaceous species. This hybrid has the advantage of being a perpetual bloomer. M. Baltet exhibited before the Committee of Ornamental Arboriculture several shrubs in fruit. The most conspicuous were *Coton-easter tomentosa*, *C. Nepalensis*, *C. horizontalis*, *Cratægus Carrieri* and *C. Crus-galli*, *Lycium Sinense*, *Rhodotypos kerrioides*, *Ligustrum Iboia*, *L. vulgare* and *Diospyros Lotus*.

Two interesting plants have recently found their way into commerce here. One is the *Genista Andreana*, of which Croux & Sons, of Val d'Aulnay, near Sceaux, have purchased the stock. This plant was found growing wild in Normandy with *Genista Scoparia*, of which it is only a variety with red-flowered wing-petals, which make a good contrast with the bright yellow of the other parts of the flower. This plant was described and figured in August, 1886, in the *Revue Horticole*, and was exhibited in Paris last summer. The *Genista Andreana* is a sand-loving plant, but it can be cultivated on clay soils if it is grafted on the common Laburnum. The second new shrub is *Euscaphis staphyloides*, introduced into commerce by M. Lemoine, of Nancy. It is closely related to the *Staphylea*, which it much resembles in its general habit. It is a native of Japan, where it is known as *Gonzui*, *Kitsune no tsija Cukun* and as *Dai i noki*. It is often cultivated in Japanese gardens, where it grows to a height of ten or twelve feet. The small greenish white flowers are produced in terminal panicles and are followed by a fruit which becomes scarlet at maturity and remains upon the plants until the beginning of winter like the fruits of *Euonymus*. According to Siebold, the inner bark of the roots of *Euscaphis* is bitter and astringent, and is used by the Japanese as a remedy against dysentery.

Paris.

D. Bois.

Cultural Department.

Lælia anceps.

THIS is undoubtedly one of the very showiest Orchids in cultivation. It is exceedingly popular, very plentiful and cheap, and therefore to be met with in every collection, even where Orchids are not a specialty, but where a place is retained for a few of the best cultivated varieties. The popularity of this species is not to be wondered at, when it is considered how valuable its large, handsome flowers are in enlivening the somewhat dreary aspect which naturally presents itself in our plant-houses during the sombre months of November, December and January—the season when *Lælia anceps* and its many beautiful varieties are always to be found in bloom.

The typical *L. anceps* is distinguished by having ovoid-fusiform, more or less angled pseudo-bulbs, which are from three to six inches long, and closely arranged on the rhizome. A single oblong-lanceolate, very leathery leaf, six to eight inches long, is borne on the summit of each pseudo-bulb, whence also emerges the peduncle. This latter is one and a half to three feet long, having at each node a more or less silvery-looking, keeled and sheathing bract, the tip of which just passes the base of the bract above and opposite to it. From two to five flowers are borne on each peduncle, and these, if spread out, would measure between five and six inches across. The sepals and petals are deep rose, the former being lanceolate-acute, the latter much broader and elliptic-lanceolate. A peculiar feature of the sepals—also to be observed in *Lælia pumila*—is that the upper one slants back without being recurved, and the two lower ones slant forward on each side of the lip. The side lobes of the latter organ are folded over the column, forming a tube. They are pale rose outside, creamy white inside, with interrupted lines of dark purple, which vanish in the magenta-purple of the recurved anterior portions. The middle lobe is reflexed at the tip, and of a deep magenta-purple, which presents a vivid contrast to the elevated disc, which is of the brightest yellow and bordered in front with white. The column is white behind, tinged with green and streaked with purple, and green in front, spotted in the centre and lined with purple on each side.

There are many very fine varieties of this species. One of the least known and, at the same time, one of the most distinct, is that known, as *Amabilis*, which first flowered at the beginning of last year with Messrs. Sander & Co., St. Albans. The sepals and petals are of the clearest white, occasionally flushed with rose. The lip is tinged with yellow, and has a mauve-purple blotch on the white mid-lobe, while the side-lobes are very conspicuously streaked with crimson. *L. anceps Barkeriana* is a very old but rare form, having been introduced by Messrs. Low & Co. in 1837. The flowers are of a deep rose-purple color, with narrow petals and lip. The variety *Dawsoni* is almost universally acknowledged to be the finest form of this species. The sepals and petals are of the purest white, the latter being remarkably broad, and the front lobe of the lip has a blotch of magenta-purple in front of the yellow disc. *L. anceps Sanderiana* is something like this, and is, by some, preferred to it. It flowers very freely. The sepals and petals are pure white and much larger than in the ordinary *L. anceps*. The side-lobes of the lip are stained with yellow and streaked with dark purple, and the front-lobe has a magenta-purple blotch shading off into white at the edges. *L. anceps Ballantineana* appeared for the first time this year in Messrs. Sander's nursery. It is very beautiful, being remarkable for its large flowers; the sepals and petals (the latter being very broad) are tipped with rose, and the front lobe of the lip is of a much darker magenta-purple than any form yet known. *Veitchiana* is a lovely variety with white sepals and petals, and a large mauve-purple blotch on the lip. The form *Percivaliana* has white sepals and petals flushed with lilac. The side-lobes of the lip are deep rose-purple in front with darker purple streaks on each side of the yellow crest. In front of this is a white area and then the deep magenta-purple front lobe. There are many other forms, such as *alba*, *vestalis*, *Hilliana*, etc., but it is almost impossible to depict their beauty and distinctness from each other in writing.

To the now obsolete firm of Messrs. Loddiges, of Hackney, is due the introduction of *L. anceps* to cultivation in 1835, and Messrs. Low & Co., of Clapton, were not far behind, as they soon afterward imported it. It is a native of Mexico, and I think I cannot give a better idea of its surroundings in that country than by quoting from Mr. Kienast-Zolly, of Zürich, who, writing in the *Gardeners' Chronicle* in March, 1887, says:

"During my long residence in Mexico I have many a time found plants of *L. anceps* growing in my Coffee plantation in the neighborhood of Cordova, in the state of Vera Cruz. I always met with them on the borders of the virgin forests, growing on the trunks of trees and on the very slender branches exposed to a powerful sun and to strong winds, often also clinging to the rocks covered with the remains of leaves and moss under the same conditions. During the rainy season—from May to October—these plants are daily drenched by the torrents of rain, of which they experience the full force, often for five consecutive hours, and are thoroughly wet throughout the night. About six o'clock in the morning a sharp and fresh wind, coming from the highest peaks of the Cordilleras—many of which are capped with perpetual snow—begins to dry the plants, a work which the burning sun completes, pitilessly shining on them for several hours until the daily storm drenches them afresh. Under these conditions *L. anceps* grows with extraordinary vigor, and flowers about the end of October or November; just at the time when the new bulbs arrive at their perfect development. Some weeks after the rainy season is over the newest bulbs become firm and ripe, so as to prepare for a

thorough and necessary rest, which lasts until March, when the new growths appear."

Mr. Kienast-Zolly further remarks that *L. anceps* is widely distributed along the eastern side of the Cordilleras, from Jalapa southward to Orizaba, where many varieties are to be met with, and also in some places along the Pacific coast.

From the above remarks on this species in its natural con-



Fig. 15.—*Picea Breweriana*.—See page 63.

dition, it will not be hard to judge the kind of treatment it requires under culture. The plants are generally grown in baskets, as more convenient for hanging up, and the compost used is rough peat and chopped moss mixed with corks or charcoal. Of course the drainage must be good. From March until August or September, when the plants are growing vigorously, they may be well watered every day almost, and receive as much light and air as possible, but not allowing the sun to scorch them by means of the glass roof, as would inevitably happen on hot days if slight shading were not used. After this period the flower-spikes push up, but do not produce flowers for a month or two longer. The supply of water must then be diminished little by little until the flowering season is at an end, which is generally about the middle or end of January. The plants should then enjoy a thorough rest until growth again begins. The temperature in winter may sink as low as 50° Fahr. during the night, but may reach as much as 60° or 70° during the day. In the summer these figures will naturally be some degrees higher—especially in the day-time—in both cases.

John Weathers.
St. Albans, England.

Chives.

THE bulbs of this vegetable increase by offshoots, or bulb-lets, which multiply rapidly during the growing period. It is not generally cultivated, a rather surprising fact when its ease of culture, hardiness and vigorous growth are considered. It will grow even in partial shade, and with the exception of the Onion-maggot, which will sometimes work among the roots, it has no dangerous insect enemies. It is perfectly hardy in all soils not filled with water. It grows at a low temperature, and hence is used for early salads in spring, and can be cut almost as soon as the frost is out of the ground. It responds promptly to heat and careful culture, giving a constant and rapid supply of its tender leaves, which are most acceptable wherever the flavor of Onion is desired. My first plants, a clump of perhaps fifty of the small bulbs, were divided into ten parts and set in the ground in spring. Here they grew rapidly, increased in size, till fall, when I had ten bunches as large as the one divided in spring. These re-

mained out all winter without protection, and during the second season made clumps of roots six inches across. In the fall three of the roots were lifted, with the ball of earth attached, and carried into the cold cellar, and here the tops disappeared and the roots appeared to die. In the month of February these roots were brought into the warmth of the greenhouse, and placed in the soil at a temperature of about fifty degrees

at night and seventy by day. They started at once, and in six weeks from the time of setting in the ground the tops were large enough for use, and were clipped close to the ground. The roots sent up a new growth, which was ready for cutting again in another six weeks. As soon as the supply on the open ground appeared the cutting was stopped from the roots in the house, and when settled weather came these roots were again planted out-of-doors, where they again grew with vigor. At the close of the season they were well established, and in the fall the roots for forcing were taken from those undisturbed the previous year.

The plant under consideration is the smallest member of the Onion family in cultivation. It makes a nice appearance, continuing green all the season, and in midsummer has a seed-stalk crowned with a purplish flower cluster, not unlike a Clover-head. The plants grow very evenly to a height of six or eight inches. It rarely develops seed in this latitude, and consequently is best propagated from the roots, which bear transplanting well and grow in all soils. The roots grow fairly well in pots, and if plunged in the ground in summer and rested awhile in fall, can be grown and flowered in the window.

W. H. Bull.
West Springfield, Mass.

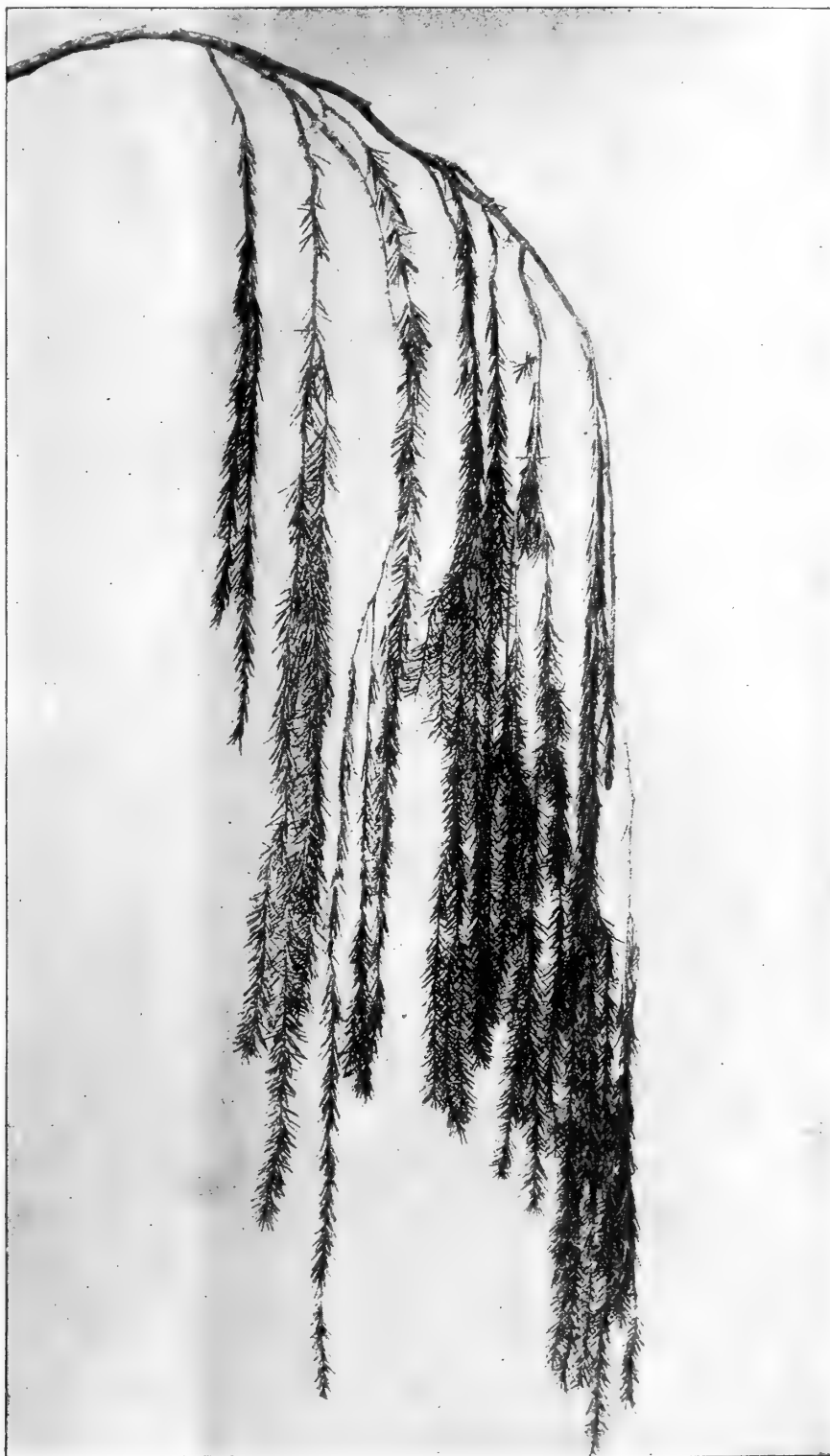


Fig. 16.—A Branch of *Picea Breweriana*.—See page 63.

Lælia albida.—This charming little Orchid will be seen in bloom in nearly every collection about this time, and is justly valued for its spikes of delicately-tinted and fragrant flowers. It is well adapted for cut flower or bouquet work, and lasts a considerable time in water. *L. albida* is found very abundantly in the southern part of Mexico, generally at considerable elevations. It was introduced nearly sixty years since, and has always been a popular Orchid. Its cultural requirements have not as yet been thoroughly understood, for no matter how good and strong the imported plants

may be, they surely dwindle away in a few years, and fresh supplies have to be brought from their native habitat. The best success has been attained by giving them abundance of air and sunlight, plenty of water during growth, and rest in a cool, dry house.

Kenwood, N. Y.

F. Goldring.

Notes from the Harvard Botanic Garden.

CYCAS REVOLUTA.—A large specimen of this Cycad has been in fruit in the Palm-house here for several months, and it has proved of much interest to visitors. Last spring a series of little leaves—downy and yellowish, from six to twelve inches in length, and altogether different from the regular leaves—appeared upon the crown of the plant; and some weeks later the fruits appeared upon the sides of these leaves, being arranged singly along two-thirds of their length, and leaving a somewhat fasciated cluster of leaflets at the top. When young, the fruits are hard and present the same downy appearance as the leaves upon which they are borne; but with age the exterior covering becomes soft, and the fruits assume a brilliant vermilion hue that can be easily seen through the loose downy covering. In size and form they resemble a large flattened prune, with two lobes at the top. Some time ago a visitor spoke of them as tiny peaches a little deformed, and there is some accuracy in the comparison. Though these fruit-clad leaves add very materially to the appearance of this beautiful plant, their production has a decidedly injurious effect upon it, inasmuch as the development of the pleasing dark green leaves is thereby considerably retarded. In the ordinary course of events specimens that bear a crop of fruit will not assume their normal appearance for two or three years. As this plant is commonly known as the Sago Palm it is believed by many that the sago of commerce is obtained from it. This is an erroneous idea. It is true that a substance with the peculiarities of sago may be obtained from the pith in the trunk; but the genuine sago is a product of *Metroxylon Sagu* (*Sagus laevis* and *S. Rumphii*), an entirely distinct Palm, from the East Indies.

GREVILLEA THELEMANNIANA.—The genus *Grevillea* includes many handsome plants, but this species is by far the most interesting. It is a dwarf shrub, of bushy habit and most graceful outline, from Australia. The branches are slender, though self-supporting, and thickly clad with fine, feathery foliage of a glaucous hue. The flowers are borne in dense globular clusters at the extremities of the young shoots, and, as the slender branches arch outward gracefully with their weight, the clusters, at a distance, look like huge tropical insects hanging from threads. The individual flowers are small and of a bright red color, and the long, slender pistils, of the same color, with conspicuous green stigmas, add considerably to the beauty of the flowers. The plant is almost constantly in bloom, but the flowers are produced most freely during winter and spring. With proper attention to soil and other necessities it will thrive satisfactorily in any greenhouse the temperature of which is not allowed to fall below forty-five degrees. It may be readily increased from cuttings of the young wood placed in a propagating frame any time during spring. Established plants may be cut back slightly during the latter part of spring, and if a shift is required it may be given when they commence growth again. Two parts fibrous peat to one of turfy loam and one of sand forms a suitable compost.

MANETTIA BICOLOR.—At the present time this is one of our most attractive stove climbers. It is a plant seldom seen outside botanical gardens, and that cannot be due to its novelty, for I saw it well grown on a globular trellis, in a private collection, a dozen years ago. It can hardly be said that lack of merit is the cause of neglect, for it is a very showy thing when liberally treated. Nor are its cultural requirements so exacting that a novice in the management of stove plants may not attempt to grow it. As the slender twining stems rapidly cover a given space, it is a most useful plant for training on rafters, pillars or trellis work of any description. The tubular flowers are small, but their brilliant red and yellow colors render them very conspicuous. They are borne in the axils of the leaves on the young shoots. Their production is periodical, and when a crop is past the plant should be given a short season of rest, after which it may be pruned slightly and again allowed to grow and flower. If planted in a bed or border, the drainage should be ample, and it would be well to confine the roots to some extent, as members of this genus tend to the production of leaves at the expense of flowers, when the roots are allowed to ramble at will. A mixture of strong loam, fibrous peat, leaf mould and sand will be found satisfactory.

Pot bound plants are benefited by an occasional watering with liquid manure.

OXALIS VERSICOLOR.—This old favorite among the many beautiful species of *Oxalis* appeals for a word in its favor as its flowers open in the morning sunshine. It is a delicate little plant, with its three inches of slender stem, surmounted by little clusters of tender leaves and lovely flowers. The petals are pure white, with the exception of a faint tinge of yellow inside, at the base, and a narrow but showy margin of bright crimson on the outer half of each. This species is usually described as having a corolla white inside and red outside; but any one who takes the trouble to examine carefully a fully expanded flower will soon find this description incorrect. The flowers cannot be seen fully developed, however, unless the sun is shining, and even then the plant must be so placed that the sunlight falls directly upon it; otherwise the flowers will remain closed or in a half opened state. Perhaps the inaccurate descriptions are partly due to this fact. A casual glance at a folded flower might give the impression that the outside of the petals is wholly red. But, whether the flowers are folded, half opened or fully expanded, they are very beautiful. If the roots are planted thickly over the entire surface of the soil in pots, or, better still, in shallow pans, the plants will form a compact mass of flowers and foliage. If planted sparsely they present a straggling and untidy appearance during the following season.

Cambridge, Mass.

M. Barker.

Preparation for Bedding.

AS the spring approaches, preparation will be in order for out-door decorations in the way of bedding, and many new plans and new plants will doubtless be considered. The list of plants available for this purpose has been largely extended of late years, not merely by the introduction of new ones, but also by the discovery from year to year that various plants, not before used to any extent in this particular field, are perfectly adapted to it. For bedding, and especially for sub-tropical bedding, there appears to be a growing interest, and as a varied effect is usually sought for, a large number of species and varieties may be used. Of course groups of a single plant are often effective. There are many places where, for instance, a large mass of bronze-leaved *Cannas* or a clump of *Arundo donax* may be just the ornament needed.

Among the old plants not often seen is *Humea elegans*, a truly elegant plant when in good condition, and peculiarly effective in a sub-tropical bed, its graceful feathery-looking inflorescence of brownish red being very attractive, and forming quite a striking contrast with the large light green leaves, which are somewhat similar in character to those of Tobacco. *Humea elegans* is propagated from seeds, which are best sown in the autumn, so that the plants may attain considerable size before planting out, an operation which should always be deferred until settled warm weather, or about June 1st in this latitude. This plant grows well in a light, sandy soil, well enriched, and the young stock should not be allowed to become very much pot-bound at any time, else the loss of the lower leaves usually follows.

Acalypha Wilkesiana (or tricolor) is also a striking plant when used outside in summer, growing as freely as a *Coleus* and about as easily propagated. *Acalypha marginata*, the leaves of which are quite large and showy, being brown or bronze in the centre and surrounded by a light colored margin, may be used in the same manner, and with equally good effect. Cuttings of these plants should be put in now, and if placed in a warm house they will root in a few days. The *Acalyphas* are not fastidious as to soil, but they do well in good loam, to which may be added a small proportion of peat if convenient, to make the soil a little more open. Last summer I observed a large circular bed planted with *Begonia semperflorens* surrounded with a ring or edging of *Acalypha Wilkesiana*. The *Begonias* were covered with flowers and the contrast was decidedly pleasing.

A striking plant when in flower is *Lasiandra macrantha*, its large bright purple flowers being most showy. It seems a pity that the flowers of this handsome plant should be of so ephemeral a character, seldom lasting for more than a day out-doors when the weather is bright, but still they are produced in such profusion that the plant is seldom out of bloom during the summer. This plant has not been largely used for bedding purposes, though its adaptability was proved a number of years ago. The idea which once prevailed, that the *Lasiandra* was essentially a stove plant, was dispelled long ago.

If not already sown, seeds of the Abyssinian Banana (*Musa Ensete*) should be sown at once, so that the plants may be strong and vigorous before planting out. The Musas require

liberal treatment, and should not be planted out until the ground gets warm. It is always advisable to plant them in a somewhat sheltered location, for when exposed to the full force of the wind the foliage becomes so torn as to sadly mar its beauty.

Among the toughest of plants, both for bedding in summer and also for conservatory decoration in the winter, are the *Strelitzias*, the leaves being so strong in texture that they are seldom injured by storms. The best known variety, *Strelitzia Regina*, produces its odd-shaped and brilliantly colored flowers quite freely, and invariably attracts much attention, the combination of colors, bright orange and blue, being an infrequent one. *Strelitzia augusta* is a stronger grower than the preceding, and larger in all its parts, the leaves being borne on long petioles and having some resemblance to those of the so-called "Traveler's Joy" (*Ravenala Madagascariensis*). Both of the above-mentioned *Strelitzias* are natives of the Cape of Good Hope, and may be propagated from seeds, when these are to be had, or by division of the plants.

The improved Cannas of recent introduction have deservedly attracted much notice during the past season, and will doubtless be planted in large quantities for the coming summer. The Cannas are unquestionably at the head of the list of large bedding plants, and when they combine, as in the above-mentioned improved race of varieties, large and highly colored flowers with handsome foliage and comparatively dwarf habit of growth, they become doubly desirable.

Holmesburg.

W. H. Taplin.

Cannas as Annuals.—While Cannas for many years have been among the most ornamental of garden plants, the recent addition of the French hybrids, with their brilliant flowers, has added much to their value and attractiveness. Many named kinds with large flowers; brilliant reds of various shades, and yellows, some of them spotted with red, are now offered. But Cannas are so readily and soon to be had from seed that unless some special color is desired in quantity it seems scarcely worth while to bother with wintering old roots. Seeds of Crozy's Cannas, to be had of the seedsmen, will produce many of the named kinds exactly and give a good range of colors. Now is the proper time to sow them in order to secure fine plants in May. The seeds should be lightly filed through the hard outer coating, which should be softened by soaking in tepid water for twenty-four hours, after which they may be sown in moist soil, and kept in brisk heat until germination, which soon takes place. I have had good success by sowing seed in a pot which was placed inside a larger one, this being plugged to retain moisture, and the space between pots being filled with sand, and all covered with a glass and placed on the pipes. After germination the plants should be potted into good soil, well supplied with moisture (after the roots commence to run, of course), and they soon make great headway. Stocky plants two feet high may be had in late May. I do not find this strain of Cannas to be dwarf, however, as under fair culture only they will grow to the height of five or six feet.

Elizabeth, N. J.

G.

Correspondence.

An Example in Tree Planting.

To the Editor of GARDEN AND FOREST:

Sir.—For some years during my connection with the Michigan Horticultural Society, forestry topics were sandwiched in among the other subjects upon the programmes of conventions upon the theory that the continuous success of horticulture in our state was intimately connected with the conservation of our timber areas. The discussions seemed to be fraught with little good, because the papers were either looked upon as simply interesting or stigmatized as "hypothetical nonsense, with no foundation in practical affairs of rural life." And worst of all, in the discussions the severe utilitarians seemed usually to have the best of it. That is, the men who argued from figures that more income could be derived from the cleared land than would furnish all the wood products the area of timber could produce, carried more weight than the tree-lovers, whose argument always touched upon a longer foresight, somewhat ignoring the immediate turning of a penny.

I became a good deal discouraged about awakening an interest in the subject; and although I could see disastrous effects from the clearing away of the timber in southern Michigan, I could not convince others.

Circumstances gave me an opportunity in 1878 to sow several rows in the garden west of my house with the seeds of

three varieties of Maple, two of Ash, two of Elm and one of Alder. I also planted seedlings of Norway Spruce, Austrian Pine, Arbor-vitæ and European Larch in parallel rows alongside. I cultivated them, and they grew thriftily. In the meantime, to the westward of me for miles, the timber gradually disappeared, until the wind now has a sweep for a long distance, with nothing to break its force. It was not later than 1883 that neighbors began to inquire if I would sell some of those ornamental trees. I had none for sale, but gradually began thinning out the plantation and giving plants to my neighbors. The school-ground was planted with some of the surplus; numbers found their way to the cemetery; rows of them were planted along the highway. It seemed marvelous how many could be spared and still how many remained. The grove has thickened and made a complete barrier. Many of the trees are twenty feet in height; and weekly, almost daily, in the winter season, I hear the remark, "What a complete protection the grove makes for your buildings from the force of the prevailing winds."

Shrubs and tender plants are grown under the lee of this grove that will not withstand the severity of the open blast. My coal bill is lessened, my general happiness and that of my friends admirably subverted. I have been enabled to contribute to the especial wants of my neighbors in a delightful way. Others have appreciated the argument and have followed my example. The logic of deeds has been more convincing than the argument of words.

Grand Rapids, Mich.

Charles W. Garfield.

Worms in Violet Roots.

To the Editor of GARDEN AND FOREST:

Sir.—The report of Professor Comstock's paper before the Western New York Horticultural Society upon the Clematis Disease has particularly interested me, for my investigations have led me to ascribe a part, at least, of the Violet disease to the same or a similar cause. Several fungi, as for example *Ascochyta Viola*, Sacc, *Cercospora Viola*, Sacc, and a *Peronospora*, have been found; but these did not account for all the trouble. For example, in some beds dwarfed and sickly plants would be found that did not show the presence of any fungus. Such plants, however, when pulled from the soil showed peculiar enlargements upon the roots, and these galls, when sliced and placed under the microscope, exhibited all stages of what seems to be a species of *Heterodermis*. Since this location of the trouble of such sickly plants in the roots where the Nematodes breed and rob the Violets of their vital juices, I have visited a number of Violet growers, all of whom had the sick plants, and in every case the worms have been found in the roots. Other growers have been reached through the mail with a request to examine the roots of any sick plants, and they report the finding of the root-galls.

It therefore seems clear that to the Clematis, as determined by Professor Comstock, and the Peach, Orange, and a long list of other cultivated plants, as worked out or reported upon by Dr. Neal,* of the Florida Experiment Station, and Professor Geo. F. Atkinson,† of the Alabama Experiment Station, the cultivated Violet must be added as a plant liable to attacks from these eel-worms. The two large and fully illustrated bulletins, just at hand from the south, and the paper by Professor Comstock, make it evident that there is a large field for the economic helminthologist.

N. J. Experiment Station, January 31st, 1890.

Byron D. Halsted.

A Rare Buttonwood.

To the Editor of GARDEN AND FOREST:

Sir.—Usually we expect to find our native Buttonwood-tree in ground which is at least damp. Much more frequently it is seen hanging lovingly over some stream of fresh water, or shading a country spring-house while the roots dip into the spring itself. Very rarely, however, do we see it on the tip-top of a high (and from all external signs), dry hill. If we should observe one in such a position we should expect to find it small for its age, and giving plain indications that the site was not the one best suited to its needs.

Recently, however, in Chester County, Pennsylvania, I measured one, which was growing in high, dry ground, which was, at two feet from the ground (just below its first limbs), twenty-one feet and eight inches around. One limb was ten feet and four inches around, and another eleven feet and five inches. The spread of the branches was something over ninety feet. Its height was about eighty feet.

*"The Root-knot Disease of the Peach, Orange, and Other Plants." Bulletin No. 20, Division of Entomology, U. S. Department of Agriculture, 1889.

†"Nematode Root-Galls," December, 1889.

The tree is quite vigorous, and shows no signs of declining strength. There is near by another, probably larger, specimen on lower but quite dry soil.

University of Pennsylvania.

J. T. Rothrock.

Abraham's Oak.

To the Editor of GARDEN AND FOREST:

Sir.—Allow me to add the following to your account of Abraham's Oak (vol. ii., page 602), which I find in Hones' "Early Day Book," vol. i., p. 507, published in London in 1866:

"We are told that this Oak was standing in the fourth century. Isidore affirms that when he was a child in the reign of the Emperor Constantine he was shown a Turpentine-tree, very old, which declared its age by its bulk, as the tree under which Abraham dwelt; that the heathen had a surprising veneration for it, and distinguished it by an honorable appellation. Some affirm that it existed within the last four centuries.

"At the dispersion of the Jews under Adrian, about the year 34, an incredible number of all ages and sexes were sold at the same price as horses in a very famous fair called 'the fair of the Turpentine-tree,' whereupon the Jews had an abhorrence for that fair. St. Jerome mentions the place where the Jews were sold as 'Abraham's Tent,' where, he says, 'is kept an annual fair very much frequented.' This place, on Mamre's fertile plain, is alleged to have been the spot where Abraham entertained the angels."

The allusion to the Turpentine-tree indicates, perhaps, some other tree rather than the Oak now known as Abraham's Oak, possibly some leguminous tree, or perhaps the Lotus, *l'arbre des Lotophages* (*Zizyphus Spina-Christi*).

Boston, Mass.

Francis Skinner.

The Western New York Horticultural Society.

The Annual Meeting at Rochester.—II.

TO our report of the meeting in last week's issue we add abstracts of a few more of the papers read. Besides these papers there were reports from each county, which contained practical hints of great value to fruit-growers. The exhibition of fruit was smaller than that of last year, but it contained a remarkably fine collection of Pears from Ellwanger & Barry, among them a group of Cox's Seedlings, which have rarely been seen. These were all fine looking Pears and they promise to keep later than any of the varieties now cultivated.

LATE EXPERIENCE WITH INSECTS INJURIOUS TO ORCHARD AND GARDEN.

Dr. J. A. Lintner, State Entomologist, in treating this subject, said that a great impetus had been given to the study of economic entomology by the experimental stations, thirty of which have enrolled an entomologist among their faculty, some of them the most distinguished in the country, so that there is every prospect that within a few years the most injurious insects will be brought under control. The stations give opportunity to test the preventions and remedies under varied conditions of soil, climate, season, etc. This increase in the number of working entomologists and the enlarged fields for their research has led to the organization, during the year, of the Association of Economic Entomologists, whose aim is to co-operate, so that duplication may be avoided.

The force pump now plays a most prominent part in operations against insects in orchard and garden. The ease with which the codling moth can be controlled, and apples grown of full size, perfect form, rich in color and of highest flavor, and resistance to early decay, is sufficient proof of its value; and by its aid we hope to defy the Plum curculio, and check the ravages of almost every insect feeding upon the foliage of trees, and a large number of those which attack the products of our gardens. No orchardist or gardener can afford to do without a force pump. It is costly neglect. The cheap and fatal spray, compared with old methods of fighting, is as a gatling gun compared with a flint-lock musket.

Experiments have shown that stronger mixtures of arsenical poison have been used than necessary, and that in no case need they exceed the strength of one pound of the arsenite to 200 gallons of water. The foliage of fruit-trees has at times been injured by insecticides, so that the minimum amount of

arsenite should be used that will suffice for its purpose. Experiments for determining this will be a portion of the work for the ensuing year. It would seem that the arsenites are more liable to injure foliage which is advanced than when it first appears. If this fact is established, the mixture for later spraying should be weaker. Different fruit-trees are susceptible to the poison in different degrees. Apple and Cherry are least affected, Plum-trees are more susceptible, and Peach is most easily injured. For Plums one pound of the arsenite to 250 or 300 gallons of water should be used, and for Peaches the latter dilution is recommended.

Water as an insecticide has been used by Mr. L. C. Howard, of the Entomological Division at Washington, effectively against the Rose-slug. Rose-bushes covered with slugs were treated with tobacco soap, which killed them, but stained the petals; pyrethrum mixed with flour also killed, but it was expensive; sifted coal ashes were effective, but destroyed the looks of the bushes; then the garden-hose was turned on and a strong stream of water directed to the foliage each evening, and the bushes remained green and beautiful. The stream of water was also used against plant-lice on Currant-bushes, web-worms on shade-trees, and ants which built little mounds on the lawn and in the cracks of a brick walk; and best of all, it broke up the nests of the English sparrows in the Ivy and over the windows. Dr. Lintner has confidence that a coarse spray of water thrown with force will destroy many pests besides these. It will be efficient against the little white Rose-leaf-hopper; against the several species of the small leaf-hopper which infests the Grape-vine; as well as all plant-lice which can be directly reached. Rain-storms arrest attacks of the Apple-tree aphid and the Hop-vine aphid. If these insects can be knocked by a jet of water from their food plant while their beak is inserted into it they will die if the smallest portion of the tip of the beak is left behind in the plant.

The recent working out of the life-history of the Rose-bug at Washington may, when published, aid in the operations against it; but Dr. Lintner has long thought that the most successful means of contending with this pest is to be found in the study of its breeding-grounds. It is a local insect, appearing suddenly in immense numbers and in particular localities, and there is therefore reason to believe that it has its particular breeding-grounds. A lady in Virginia states that year after year the Rose-bugs come in myriads from a brush-covered swampy bit of sand that is always wet and was once in a bed of a river now flowing in another channel. They are true to their date of appearance each year, true also to their line of flight, which she has mapped out. They move in a body five hundred feet broad up the old river bed as far as a point indicated on the map. The second day they rise higher in continued flight, spreading somewhat and reaching certain points beyond, and their progress for two or three days thereafter can be almost certainly predicted. If more data of this sort could be gathered we might learn something of the breeding grounds of this insect.

In June, 1888, Mr. Barry's newly set Pear-trees were attacked by an enemy which was found with one end inserted into the fruit. The depredator was the larva of a small tineid moth of the group known as case-bearers, from the small case which they construct for their covering while in the caterpillar stage. The case is never deserted by the larva, but is carried about upon its body, and from it the head is thrust out to feed, and in this instance the head and front segments are buried into the fruit, the case projecting and appearing as if a bit of small twig had been stuck into the pear. Specimens of the fruit show that the caterpillar bores a hole of about the diameter of its body, that of an ordinary pin, to the depth that it can protrude from its case; withdrawing, it removes a space, and again burrows until many holes were drilled into each pear. One pear of half an inch in diameter showed forty-four borings. Of course this means destruction to the fruit, which becomes as it grows gnarled and unfit for use. Detection of this attack explains the cause of much unsightliness and deformity in apples and pears which, from the different character presented at a later stage, had been a perplexing mystery, and no one had been able to refer it to any known insect. A month later some Duchess pears from another part of the state showed a defect which Dr. Lintner at once recognized as caused by this insect. It is probable that this attack will be widespread and the cause of injury can now be traced. If the insect appears in injurious numbers it can be destroyed by spraying with an arsenite soon after the setting of the young fruit.

Dr. Lintner gave some interesting facts relating to the pear-blight beetle, a new enemy of Quince-blossoms, the Peach-bark burrower, the Cherry-tree slug and many other pests

which have made themselves conspicuously disagreeable during the year, and gave also the cheering information that a large plant-insect, identified as a *Podisus*, had been found preying upon the Currant-worm, a fact which encourages the hope that this annoying pest may be more easily controlled.

TESTING VARIETIES OF FRUITS.

Mr. C. E. Hunn, of the Geneva Experiment Station, gave an interesting account of the work in this direction under his charge, and the conditions under which new varieties were received from originators, protected from rival growers and finally reported upon. The paper concluded with the statement that there were now under comparative trial at the Geneva Experiment Station the following varieties of fruits: 300 varieties of Apples, 120 of Pears, 97 of Plums, 53 of Cherries, 151 of Grapes, 98 of Strawberries, 57 of Raspberries, 24 of Blackberries, 24 of Currants, 16 of Gooseberries. These are reported on as they come into bearing, with as full a description as possible.

Of the Strawberries tested at the station in the season of 1889, the following were found promising: Burt's Seedling, a good substitute for Wilson; Bomba, Crawford, Daisy, Enhance, Farnsworth, Hoffman, Haviland, Ivanhoe, Middlefield, Augur's No. 70 and Warfield.

For market the following are commended: Haviland and Hoffman, early; Daisy and Burt's Seedling, medium; Bubach and Crawford, late.

For the kitchen-garden the following are promising: Bomba and Haviland, early; Ivanhoe, medium; Farnsworth and Middlefield, late.

There were fruited on the station grounds the past season 1,000 seedlings, many of them crosses. In the study of them many interesting facts have been obtained, among which are the following in regard to pollen bearing blossoms: Of forty-six seedlings from Wilson all had perfect blossoms; of seventy-four seedlings from Daniel Boon, forty were perfect and thirty-four were pistillate; of fifty from Crescent, eleven were perfect and thirty-nine were pistillate; of forty from Sharpless, thirty-nine were perfect and one was pistillate; of forty from Old Iron Clad, thirty-seven were perfect and three were pistillate; of sixty-five from Crescent, crossed with Lennig's White, thirty-five were perfect and thirty were pistillate; of thirty-four from Crescent, crossed with Sharpless, nine were perfect and twenty-five were pistillate.

While the chance seedlings afford a lesson in variation, it is the crosses that should be studied. It would naturally seem that a variety as vigorous and well supplied with pollen as the Sharpless would be more potent to carry its pollen bearing quality than one of the habit of Lennig's White; but the contrary is the case in this instance, and the contrast seems too sharp to be merely chance. If this potency continues to hold good through other tests, it will be a great benefit to the experimenter in perfecting any pistillate variety, as in the case of a very late pistillate kind, of rank growth, vigorous habits and free blooming qualities, but blooming after all the pollen bearing varieties have passed out of flower. If we can be sure of a perfect variety of weaker growth, but potent to carry its pollen, it will be one step toward accomplishing our ends.

THE PLANTING OF SCHOOL-GROUNDS.

A paper on this subject by Mr. John J. Thomas began by assuming that if attractive surroundings in a home are better than those which are repulsive, certainly it is better that children should live under the influence of surroundings that are orderly and pleasant than among those that are rude and debasing. There are 5,000,000 children of school age in the country, and it should be a matter of concern to know the character of the place in which they spend a large portion of five days at least of every week at a period of life when they are most susceptible to all impressions. It certainly is better that the school-house and grounds should be attractive rather than unrefined and comfortless. And yet there are many school-houses whose appearance and arrangements are calculated to give lessons in anything else than in order and tidiness and beauty. Mr. Thomas spoke of a region through which he once drove where he passed two farms with brick barns which cost from \$6,000 to \$8,000 each, and within a mile of these, on a side road, was the school-house which the children of the owners of these barns attended. The building had originally cost, say \$400, including the rail-fence which surrounded it. It had never been painted. There were no shade-trees about it. It stood bare and comfortless, and the only comely thing on the premises was a neatly dressed school-mistress, seen through the window. Now, suppose these men, who were willing to spend thousands of dollars on buildings in which their animals were housed, had been willing to pay a little attention to

the ornamentation of the grounds where their children were receiving instruction, is it not to be presumed that the influence of a pleasant shrub-bordered lawn and some well kept shade-trees would have helped in the formation of proper habits of thought and a proper recognition of what is lovely in nature and in art? The decoration of school-grounds can be made at a trifling expense. The ground in the beginning should be thoroughly broken and harrowed and then seeded to grass. It should be planted with some native shrubs and trees, and the boys and girls should be made to feel an interest in maintaining it. The play-ground proper may be in the rear of the building, and if the students are furnished with a cheap mower they will take pride in keeping the lawn in front well clipped and tidy. Besides this, if our native trees—Hickories, Oaks, Birches and Pines—are planted in groups, many interesting lessons in botany can be drawn from them by a skillful instructor. Flower-beds should be used with caution, but when children are properly interested they can be introduced to advantage, and it is certain that the influence of such a pleasant ground will do something toward improving and elevating taste and character.

In the discussion which followed it was objected that boys take the greatest delight in destroying everything that is planted in school-grounds. On the other hand, several members related their experience to prove that the interest of the children themselves can be enlisted, and then the danger of destruction is small. One speaker stated that he had planted the grounds of the school in his district three successive times, and the trees were always destroyed; but on the fourth occasion he invited the pupils to his nursery to dig up the trees for themselves. He accompanied them and directed the planting, which was also done by them with some little ceremony, including music, speaking and a pleasant collation. The result was that the whole school has entered heartily into the garden project, and has added flowers and shrubs, which they are watching with the utmost care.

The May frost, which did so much damage to fruit crops last year, did less injury to pears than to any other kind of fruit.

There never has been a glut in the market of first-class fruit. When carefully graded, the first quality always finds sale. It is the mixture of inferior fruit and fruit improperly prepared for market which brings down prices.

The area of land devoted to the cultivation of the Grape is rapidly increasing in Chautauqua County, and the so-called "Vineyard District," which extends for forty miles along the south-east shore of Lake Erie, will soon be entirely given up to this industry. Last year 360 acres were devoted to the propagation of the vine, and more than 10,000,000 cuttings were rooted.

Professor Caldwell, in speaking of the effect of fertilizers, cited an instance where wines of a particularly rich bouquet were made from grapes in a district whose soil was peculiarly rich in phosphate. A long treatment of phosphatic fertilizers was given by an experimenter to certain other lands where this element was less abundant, and, after thirty years, the peculiar bouquet appeared also in the wine produced from the latter district.

A letter was read from the venerable Lewis F. Allen, who is more than ninety years old and who settled in Buffalo when it was a village. Sixty years ago Plum-trees were found everywhere and were abundantly productive. Neither the curculio nor the Black Knot had then been heard of. Along the Canada shores of the Niagara River were Peach-trees ten inches in diameter and forty years old. The new-comers, encouraged by these indications, planted many Peach orchards on Grand Island and the neighboring shores, which were very profitable for a time. Thirty years later, however, the yellows came, and hardly a single tree is now living.

In the course of an address on the Fruit Evaporating industry, Mr. Michael Doyle gave some interesting facts concerning "chopped apples," a dried product from inferior fruit and material left after the preparation of the best quality of evaporated fruit. The export trade in this product had increased from small orders in 1880 to 11,000,000 pounds in 1888, and 20,000,000 pounds could have been sold in 1889. Cider was said to be a staple drink in northern France, and 276,000,000 gallons were consumed there annually. The chopped apples taken from here, and largely used for conversion into cider, are thoroughly dried, and are preferred to the home growth, being better preserved and of finer flavor. There now appears room for all we are able to export, although the Apple crop in France was valued last year at \$19,000,000—which seems like an enormous product for a single fruit.

In the report from Ontario County the following varieties—some of them new and some old ones which had not been generally planted in that region—were named as very desirable or promising: Of Apples, Longfield, Milding, Sutton's Beauty and Hubbardson's Nonesuch. Of Pears, Vermont Beauty is one of the very finest. Of Plums, French Damson, Field, Stanton, Prince of Wales, Middlebury, Peters' Yellow Gage—one of the very best of its color, The Czar—the best early, Diamond—a first-rate purple. Of sour Cherries, Montmorenci and English Morello. Of Early Peaches, Horton's Rivers, a seedling of Early Rivers, a most valuable introduction, and Hurd's Surprise. Of Apricots, a variety named Harris ripened in July. Of new Grapes, Geneva, a white seedling, seems worthy of trial. Of Currants, Fay, Moore's Ruby—the best flavored Cherry Currant yet produced. Of Blackberries, Early Barnard from Wisconsin the hardiest and best flavored.

Recent Plant Portraits.

Botanical Magazine, January:

HELIAMPHORA NUTANS, *t.* 7093; the remarkable South American representative of the North American Pitcher-plants, discovered half a century ago by the brothers Schomburgk in marshy savannahs near the base of Rossima, in British Guiana. It differs from the Sarracenias by its four to six parted perianth, three to five-flowered scape, uni-bracteal flowers, minute stigma, and by the small rudimentary lid of the pitchers. "Viewing their relations," Sir Joseph Hooker, the editor, remarks, "between these three genera to one another, the question naturally arises whether to regard *Heliamphora* as a degraded, or an ancestral member of the order. I incline to the latter view, though it points to the surmise that the order originated in a region now separated by upward of 2,000 miles from that inhabited by one of its other members in so far as their distribution is known." *Heliamphora* was rediscovered by the Orchid-collector, Burke, who brought plants to the Veitch Nursery in 1881. The illustration is from a plant which flowered at Chelsea in June of last year.

PLEUROTHALLIS ORNATA, *t.* 7094; a minute Mexican Orchid of botanical interest only.

PROTEA NANA, *t.* 7095.

ROSA BERBERIFOLIA, *t.* 7096; the simple-leaved Rose of Persia and western Turkestan, a charming species with small yellow flowers, and morphologically of the greatest interest on account of its peculiar leaves, whose stipules Dr. Masters has recently shown are suppressed, although potentially present; and therefore possibly to be developed in vigorous cultivated specimens. *Rosa berberifolia*, long considered difficult or impossible to cultivate, is now well established under glass at Kew.

IRIS BOISSIERI, *t.* 7097; a new bulbous species known only on a single mountain in Portugal. It belongs to the true Xipheons (the English and Spanish Irises of gardens), and its nearest relative is the Spanish *I. filifolia*. It differs, however, from its congeners in having a rudimentary band down the keel of the lower part of the outer segments, but for garden purposes it is hardly distinct enough in habit or in the form or coloring of the flowers to attract much attention.

SOBRALIA XANTHOLEUCA, *Revue Horticole*, January 1st.

Notes.

In Germany, young Spruces sold for Christmas-trees are often dusted over with fine shavings and a "brilliant" powder to imitate snow.

Small Ferns still occupy a prominent place in dinner-table arrangements, though the list of varieties used in quantity is quite short, *Adiantum cuneatum* as usual taking the lead.

An English correspondent notes with some satisfaction that the list of new Orchids for the year just past shows that the custom of giving hybrids Latin specific names is on the wane.

The Executive Committee of the Association of American Cemetery Superintendents have issued a circular calling upon the members to suggest at once desirable subjects for discussion at the meeting which is to be held in Boston next summer at the same time with the convention of the Society of American Florists.

The Pennsylvania Horticultural Society celebrated its sixty-first anniversary, on the 21st of January, by a large meeting of its members, together with many delegates from sister societies. Mr. George W. Childs, the newly elected President, took the chair for the first time in the hall that had been elabo-

ately decorated for the occasion. There was also an exhibition of remarkably rare and choice flowers.

The *Revue Horticole* calls attention to the fact that the name of the introducer of the Chrysanthemum into Europe is correctly written Pierre Blancard, and not Blanchard or Blanchart, as the name is sometimes written. Blancard was a sea-captain who made several voyages to Japan, and it was on his return from one of these voyages that he brought back to Europe the parents of many of the present race of cultivated Chrysanthemums.

The use of potted evergreens, such as *Retinosporas*, *Arbovitæ* and plants of similar character for house decoration, is on the increase, and some of our florists report ready sale for such plants in six and eight-inch pots. Many of these plants are lifted from the open ground in the fall and after being potted are placed in a cold house or frame until needed. They are useful decorations on account of their lasting qualities when exposed in draughty halls and similar locations, though they are too often arranged so as to give a rather formal effect.

M. André, in a recent issue of the *Revue Horticole*, mentions the fact that the finest specimen of the weeping *Sequoia gigantea*, one of the most interesting and remarkable of all conifers of abnormal growth; exists in the garden of M. Allard, at the Maulevrier, near Angers. It is about twenty-two feet high. The weeping *Sequoia* forms a slender, tapering column, the long pendent branches almost clinging to the main stem. This variety originated in France a few years ago, and among introductions of comparatively recent years no conifer showed at the Exposition in Paris last year created more admiration. M. Allard's collection of conifers, of Hollies and of Oaks, although not long established is one of the most interesting in Europe. It contains five specimens of the form of *Abies concolor*, peculiar to the mountains of Colorado, which cannot be equaled, perhaps, in Europe, in size, and particularly in the deep blue color of their foliage.

The meeting of the New York State Forestry Association, at Columbia College, on Saturday, February 1st, was called to order by Professor E. B. Southwick, the Secretary. Rev. Dr. Charles H. Hall, of Brooklyn, presided as temporary Chairman, until the arrival of General Egbert L. Viele, one of the Vice-Presidents. Hon. Warren Higley explained the object of the meeting. Letters from Hon. Seth Low, Edward M. Shepard and B. E. Fernow were read, and brief addresses were made by Judge Higley, Dr. Hall, Professor Daniel S. Martin, Dr. N. Jarchow, William Potts and J. B. Harrison. Mr. Morris K. Jesup, General Viele and Judge Higley were chosen as a committee to memorialize the Legislature in favor of efficient legislation for the preservation of the Adirondack Forests. General Viele, Professors Martin and Southwick, Mr. Potts and Mr. Harrison were appointed a committee to report to the next meeting amendments to the constitutions and nominations for permanent officers. The meeting adjourned to meet at three P. M. on Monday, February 10th, at Columbia College. The purpose is to complete the reorganization of the Association, and at once to enter upon active work for the promotion of suitable forestry legislation and the development of public interest in rational and practical methods of forest management.

The distinguished French botanist, Ernest Cosson, died in Paris on the last day of last year in his sixty-ninth year. Dr. Cosson published, in 1845, in connection with Germain de Saint Pierre, a classical and much esteemed *Flora* of the suburbs of Paris, of which three editions have appeared. M. Cosson was appointed, in 1851, Botanist to the Commission for the Exploration of the French Possessions in Africa; and the African flora has almost exclusively occupied his attention from that time until the day of his death. The seven years between 1852 and 1859 were largely devoted by him to examining in the field the vegetation of northern Africa, which he has since described in numerous important papers and memoirs. His great work, an illustrated *Flora* of Algeria, too long delayed by frequent arduous journeys in pursuit of additional information, remains, unfortunately, unfinished. M. Cosson was a man of independent means, which he devoted, like Bentham in England and the De Candolles and Boissier in Switzerland, to advancing the science of botany. His herbarium, unsurpassed in Algerian plants, was constantly enriched by acquisitions purchased from collectors in all parts of the world; while his botanical library had become one of the most valuable in the possession of an individual. This library and his herbarium M. Cosson placed always at the disposition of botanists, French and foreign, and many Americans remember with gratitude his kindness and the hospitality of his house in the Rue Boétie.

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Forest Questions Before Congress.

ON January 20th President Harrison transmitted to the Senate and House of Representatives a memorial from the American Association for the Advancement of Science, relating to the preservation of forests upon the public domain, accompanying it with a message earnestly recommending that adequate legislation be provided to arrest the rapid and needless destruction of our great forest areas.

The memorial recalls the fact that the first national legislation which recognized the value of the country's forests and the necessity of throwing about them some protection, grew out of the presentation of the subject to Congress by a committee of this Association. This presentation led to the appointment, in 1877, of an agent, and later to the establishment of a Forestry Division in the Department of Agriculture, for the purpose of gathering and making accessible such information as might educate people to a proper conception of the value and significance of a forest-cover in the economic life of the nation. Twelve years have passed, and sufficient knowledge of our forest conditions, and of their helpful relation to cultural, climatic and economic conditions has been gained to demonstrate that further action by the general government is indispensable if these beneficent influences are to continue.

The Association, at its last meeting, resolved that immediate action ought to be taken for the establishment of a proper administration of the timber lands remaining in the hands of the governments of the United States and Canada, to insure the perpetuity of the forest-cover on the western mountain ranges, and this memorial is presented by a committee appointed under that resolution. It represents that the action asked for relates only to the forest-lands which are the property of the nation, and that the present administration of this property is plainly unsatisfactory, and must be speedily changed if far-reaching injury is to be prevented. It is insisted upon that the relations of the mountain forests to the agricultural regions in the plains are more important than the materials which they now furnish to settlers and miners, and it is urged that the Government alone can rightly administer this property. We

may add that in the enforcement of these positions it is sharply argued that a government which feels compelled to face the problem of irrigation for the agricultural development of part of its domain can hardly solve the water question without paying proper heed to the forest question.

In view of these facts the memorialists recommend the appointment of a joint committee of the two Houses of Congress, to consider the need of legislation for the public forest domain—legislation looking toward the appointment of a commission of competent men, salaried and employed for this service alone, to investigate the necessity of preserving certain parts of the present public forest-area, for the maintenance of favorable water conditions, and to devise a practical plan for the permanent administration of such parts of it as it shall appear desirable to retain under government control.

The memorial further recommends that pending such investigation all timber lands now owned by the United States be withdrawn from sale, and provision be made to protect these lands from theft and from ravages by fire, and to supply in a rational manner the local needs for wood and lumber, until a permanent system of forest-administration shall have been organized and put in operation.

The American Forestry Association has also presented a memorial to Congress, which admirably and concisely sets forth the need of action and the reasons for it. It points out that while the immediate withdrawal of the public forest-lands from sale and entry is absolutely essential, as a first step toward their preservation as forests, it will not of itself secure this end. The destructive fires and extensive thefts will go on as before. Still less will the mere reservation of these lands from sale enable the people to utilize the timber properly. The forest lands must be administered, protected from fire, and the timber cut only when ripe, and with a view to a constant new growth. Some portion of the army can be temporarily employed to guard these lands until a practical system of administration, a common-sense application of scientific knowledge, and of the results of the experience of other nations to the needs of the place and time, can be established. This memorial, a strong and temperate document, is accompanied by a bill providing for the withdrawal of the public forest-lands from survey, sale, entry or disposal under existing laws, and for the guardianship of the army over them while this temporary act remains in force. The bill also provides for the appointment of a Commission to examine the forest-lands of the public domain so as to determine what portions should be kept permanently in forest, and, on or before the opening of the second session of this Congress, to report full a plan for the proper management of the forest-lands belonging to the nation.

It is our belief that the statements in both these memorials are true, absolutely and beyond question, and that they do not exaggerate the evils which are sure to visit the country if the destruction of our forests is not speedily arrested. It is gratifying to know that these petitions are urged upon Congress by men of such attainment and position as Professors Mendenhall, Hilgard and Bessey, William Saunders, of Canada, and B. E. Fernow, who present the memorial of the American Association for the Advancement of Science; while that of the American Forestry Association is signed by Governor Beaver, Herbert Welsh and C. C. Binney, of Pennsylvania; Abbot Kinney, of California; Edgar T. Ensign, of Colorado; and Judge Higley, of New York. The President of the United States, in his message, has followed the example of more than one of his predecessors in recommending prompt action in this matter, and it remains to be seen whether Congress will listen to these entreaties. France has no surplus to expend for any public improvement which does not yield positive and tangible benefit, but France has spent \$50,000,000 already to cure the ruin wrought by deforestation, and will spend as much more. Italy is poor, but she is appropri-

ating money to re-clothe a million acres of land which has been stripped of forests. Austria has 800 torrents to hold in check, and Prussia every year buys up waste lands for the purpose of reforesting them. What thoughtful men in this country are asking is not the outlay of millions, but the use of ordinary foresight to make such outlay unnecessary. They only ask that the most efficient agents of forest destruction be restrained for a season, until some persons who are competent can tell us what we really have, and how much of that must be preserved to save us from remediless disaster. A refusal on the part of Congress to give heed to this appeal, which is repeated year after year with increasing earnestness and urgency, would be little less than criminal.

The portrait of a remarkable Walnut-tree found growing by Professor Rothrock at Lower Brandon, on the lower James River, in Virginia, is published in the January issue of *Forest Leaves*. Professor Rothrock describes it as "a gigantic spreading tree, which towers higher and spreads over a wider area than any of its associates. This is always plainly visible, but particularly so when winter has stripped the leaves and allowed the branches to stand out on the background of a cold sky." No one knows when the tree was planted, and nothing is known of its origin. The remarkable thing about it is, that in bark and in foliage this tree is almost identical with common forms of the so-called English Walnut (*Juglans regia*), while the nuts, which have a thick, rough and deeply furrowed endocarp or shell, and thick cell-walls, are not distinguishable from some forms of the nut of the Black Walnut; and the tree thus presents every appearance of being a hybrid between the American and the old-world Walnuts. The Walnut-tree cut last year on the grounds of the late Ben Perley Poor, near Newburyport, Massachusetts, mentioned on page 14 of vol. ii. of this journal, had the same peculiarities as the James River tree, and one of the stories told about the Newburyport Walnut was that it came originally from Virginia. There is another specimen of the same tree growing in the grounds of the Episcopal School of Harvard University, in Cambridge, of whose origin no one knows anything. The presence of American blood in these trees is shown not only in the nut, but in the fact that the Newburyport tree and the Cambridge tree are both perfectly hardy, and have grown to a large size, while the English Walnut in Massachusetts is precariously hardy, and, when it grows at all, never attains to any great size. We hope to publish a figure of the foliage and fruit of this interesting tree, but before doing so it is desirable to obtain as much information of its origin and of other individuals which may be growing in Virginia as it is possible to acquire. It is in the hope that some of our readers may be able to throw some further light upon the subject that this preliminary note is now printed.

Entrance to the Père-Lachaise Cemetery, Paris.

THERE are nineteen cemeteries in Paris, thirteen in the city proper and six in the suburbs. In the former the ground is granted in perpetuity, in the latter for a stipulated period only. The largest and most famous of all is the Eastern Cemetery, more commonly called "Père-Lachaise." It is not so ancient as is usually believed, having been laid out in 1804 under the direction of the architect Brogniart. The principal entrance, shown in our illustration on page 79, is a model of what such a construction should be—dignified, yet not obtrusive or showy, appropriately massive and severe, yet not gloomy-looking, and expressing its function in the emblems chosen for its decoration as well as in its general effect. According to French writers the aspect of the cemetery itself "is not in the least lugubrious," and they are certainly right in saying that the "majority of visitors consider it rather a promenade than a funereal spot." Nevertheless, to trans-Atlantic eyes it seems lugubrious enough by contrast with the open, park-like and cheerful look of even those American cemeteries which we think most sadly overcrowded. As can be divined from our picture, its alleys are thickly lined with tombs, many of them large and very ornate, and, though trees

grow in abundance, there is little room for grass and none for the attainment of those open landscape effects which Americans think most desirable in a cemetery. Near the entrance the wall includes but a small space on the right hand, encumbered by various official buildings. But a little further on it bends sharply to the right and the corner thus formed is the Hebrew portion of the burial-ground. From the entrance there is a considerable ascent to a point occupied by the chapel, and thence the hill slopes toward the east and the newer part of the enclosure. This part is laid out in rectangular divisions, but in the older portions the alleys are winding, and, as they meet, form various open spots which relieve the general monotony of close-grouped memorials.

The Art of Gardening—An Historical Sketch. XVII.—Ancient India.

THE luxuriant imagination of the ancient Hindu expressed itself in architectural forms which, while they lacked the purity of Greek and the intellectual suggestion of mediæval European types, have a brilliant, gorgeous beauty that harmonizes well with their semi-tropical surroundings. None of the Hindu remains antedate the time when stone replaced wood as the material of construction, and this seems not to have been earlier than the third century, B. C. But tastes and customs are peculiarly persistent in the East, and from their witness we can understand the rôle that gardening played in India in very ancient times.*

The simplest type of an old Indian garden was the enclosed court intimately connected with temple or habitation. The great Buddhist monasteries, where thousands of persons sometimes dwelt, were composed of an immense number of apartments surrounding open courts, and remains of their groves and huge water-basins may still be traced. A plan of a temple at Ramisseram, in the south of India, published by Fergusson,† shows a succession of enormous colonnades, 700 feet in length, encircling the main buildings and encircled themselves on two sides by a wide expanse of formally planted garden, all together being surrounded by a wall twenty feet in height. And everywhere we read of temple-enclosures filled with smaller temples, tanks, garden-plots, colonnades and fountains.

In such places as these the gardens were features in a great architectural whole; but there are others where the buildings were but features in the landscape. Here again, however, a true regard was paid to unity of effect. In no country, it may be said with especial emphasis, has the art of combining architectural forms with sheets of water been so perfectly understood. Both the value of the mere cool aspect of water in so hot a climate and the custom of frequent ablutions made it desirable that many buildings should stand near every lake and stream. Here temples, colonnades, terraces, kiosks and wide stairways for bathing purposes are harmoniously grouped together and beautifully composed against backgrounds of thick groves or sloping hill-sides. One of the palaces of Chittore, writes Fergusson (which were built in the fifteenth century, but by a prince of one of the old dynasties, and may be accepted, therefore, as representing an art of far earlier origin), "stands on the verge of an extensive lake surrounded by hills of great beauty of outline; and in the lake are two island palaces . . . which are more beautiful of their class than any I know elsewhere. It would be difficult to find any scene where art and nature are so happily blended together and produce so fairy-like an effect." Studying the pictures of Chittore and of many similar places, we realize that chance—the mere accident of a beautiful natural landscape—had little to do with the charm of the general result. Temple and palace were not left in isolation amid untouched natural surroundings. Platforms, terraces, stairways, walls and gateways formed the transition from one to the other; each adjunct was considered not only for its intrinsic beauty, but for its value as a feature in the general picture, and prospect as well as aspect was considered. The great palace at Oodeypur, for example, which lies in a district not overrun by Mahometan influence, "covers the entire crest of a hill, the base of which is washed by the blue waters of Lake Peshola; and this crest being insufficient for the full consummation of the architect's design, an immense terrace had been carried out on a level with it, and supported by three massive tiers of arched vaults."‡ The palace, as usual, consists of a multitude of different buildings and court-yards, and the whole is so arranged as to resemble "a vast

* There are no books to help out the witness of art. Indian literature, so very rich in many directions, includes no historical works.

† "History of Indian and Eastern Architecture."

‡ "India, Pictorial and Descriptive."

hanging garden. . . . A sparkling fountain is the central point from which avenues paved with white marble radiate in all directions, and rills of shining water flow in narrow channels until lost in the shade of Orange and Pomegranate-trees. . . . A marble gallery encircles this enchanting spot," whence the view embraces the whole valley; and "terraced gardens, crowded with summer-houses, pavilions and fountains, lead down to the lake, the shores of which are lined with fairy-like structures. . . . The arched roof of one of these . . . rests on a thousand slender columns, and all around it is woven a woof of shimmering, rainbow-tinted mist by the leaping waters of numerous fountains."

Formal flower-beds have always been a conspicuous feature in Hindu gardening, and have shown that keen sense for harmony as well as brilliancy in tint which distinguishes the race in all its artistic endeavors. Indeed, dwellers in a northern clime can hardly picture the gorgeous beauty of Indian color, produced by a combination of architectural and natural elements under the vivid blue of a southern sky.

Communication between China and India always existed to a certain extent; but the general trend of influence was eastward, not westward. The Chinese got much from the Hindus, but how much these may have received in return is far harder to decide. On the other hand, we know that ancient India was vitally affected by Persian ideas. The old Achemenid dynasty ruled to the Indus or beyond; Alexander's expedition influenced at least the outskirts of the peninsula; and the later Bactrian, Parthian, Seleucid and Sassanid dynasties followed up the work. Many elements of Persian origin can be found in Hindu architecture, and, as architecture has been affected, so has also been, in all parts of the world, the art of gardening. When Quintus Curtius writes of an Indian king it sounds like a description of some royal Persian: "His principal existence is hunting; amidst the vows and songs of his concubines he shoots animals which have been confined in a park."

On the whole, however, a distinctly national taste was doubtless expressed in the gardens of ancient India, for, despite all their borrowed details, such was the case with its buildings. The strong feeling for the picturesque and fantastic which is revealed by Hindu architecture as well as poetry had no parallel, as far as we can discern, in Persia. It speaks rather of the further East, finding its consummate expression in the gardens of the Flowery Kingdom. It is strongly illustrated in one or two pictures published by Fergusson. In some Indian districts the temples are not built, but excavated—dug bodily out of the solid rock of hill-sides. And here, at times, the approach is not by means of artificial steps and terraces, but between great boulders and free-growing trees, the effect of which is very like those "natural" arrangements which are typical of China and Japan. *M. G. Van Rensselaer.*

New York City.

Exotic Shrubs in Canada.

FRUIT-GROWING and the testing of the hardiness of fruit-trees and shrubs have received a good deal of attention in the Province of Quebec and in some parts of the lower provinces of Canada, but comparatively few trials have been made of the hardiness and value of many other trees and shrubs not indigenous, but which might prove useful and ornamental. In some old gardens about Montreal it is not unusual to find specimens of shrubby or arborescent plants which have been brought over from Europe; but, as many of these were imported from the south of England or other stations almost equally mild, instead of from the most northern countries possible, they are too often poor specimens, and unsatisfactory on account of lack of hardiness.

Few persons have experimented with any considerable number of species, but the recently organized agricultural experiment-stations of the Dominion and the proposed botanic garden at Montreal give reason to hope for some systematic experiments and reliable data in the near future. The winters at Montreal are not so severe as many people suppose, and an examination of isothermal charts and of Dr. Robert Bell's map giving the general northern limits of the principal trees of the Dominion shows this clearly. Nevertheless, when compared with the climate of eastern Massachusetts that of Montreal seems quite severe—severe enough to prevent many plants from flourishing which do admirably in the Northern States.

Three years ago a box of small specimens of some foreign trees and shrubs were sent from the Arnold Arboretum to a garden on the south side of the St. Lawrence River, opposite to and within ten miles of Montreal. Some of these plants died soon after they were received and

planted, because the season was an exceedingly unfavorable one for plants not already well established; and all those belonging to the Heath family were lost during the first year on account of the lime in the soil, a limestone region or calcareous soil being fatal to all, or almost all, the *Ericaceæ*.

An examination of the surviving plants a few weeks ago furnished some interesting comparisons with the behavior of the same species in the Arboretum at Boston.

A most interesting example is afforded by the small plants of the rare Yellow-wood (*Cladrastis lutea*) of Kentucky and Tennessee, which appears to grow freely and ripen its wood, and seems perfectly hardy in a most exposed situation without any natural or artificial protection. It promises to be a valuable addition to the small ornamental trees at the north. Attempts have often been made to introduce the beautiful Laburnum from European gardens, but so far without even the poor success which it sometimes obtains at Boston. It is almost invariably winter-killed to the ground.

The appearance of *Cercidiphyllum japonicum*, still so rare in cultivation, gives much promise that it will be of ornamental value and interest at the north. Although the ends of some of the branches seem to have suffered in winter, the little plant sent from the Arboretum is now eight or nine feet high. The seed of this inconspicuous-flowered representative of the Magnolia family came from one of the northern islands of Japan, and the hardiness of the plant so far north in this country leads to the hope that *Magnolia Kobus*, from the same region, as well as other untried northern-Japanese plants, may be able to withstand the winters north of latitude forty-five.

The Japanese *Acer polymorphum*, when not overfed or grown too fast, seems about as hardy as at Boston, where, as a rule, it is not very satisfactory, although always interesting.

The valuable collections of seeds made by Dr. E. Bretschneider in the mountains about Pekin, China, have already been referred to in GARDEN AND FOREST, and among these were stones of a Peach which he found growing wild. The plants in the Arboretum raised from some of these seeds have thrived and fruited, and a grafted plant sent to this Canadian garden now forms a good sized bush, and has not yet shown any injury from the severity of the climate. The fruit of these Chinese seedlings is white, medium-sized, poor in flavor and has a large stone; but if the plant proves hardy it will be a valuable acquisition and a good stock upon which to begin improvements. The Peach has not been grown in the open air at Montreal except in rare cases, where it has been trained to a wall and well covered in winter.

The common Quince is not successfully grown in the climate of Montreal, and this is also true of the Japan Quince (*Pyrus Japonica*), which has so far not proved as hardy and beautiful as at Boston. The plants live, but are prostrate in habit because usually badly killed in winter. They may thrive in some favored situations, as excessive moisture and late continued growth are very often the destroyers of shrubs which under opposite conditions seem hardy.

Rosa blanda is the common native wild Rose of the region under consideration, and, of various foreign species of Roses tried, none have proved so hardy and thoroughly reliable as *Rosa rugosa* and its white variety. The plants attain as large size as they do in southern New England, and they retain the habit of producing a few flowers throughout the summer and autumn after the regular season of profuse blooming. Near Montreal they have grown for at least ten years without showing the slightest injury by winter cold, and they seem hardy enough to grow in Labrador. Indeed, they are reported as perfectly hardy at St. Petersburg, which, having a winter climate which averages but little colder than that of Montreal, although with greater extremes, is situated in the latitude of sixty degrees, corresponding to the northern shores of Labrador or the southern extremity of Greenland. The red foliage of *Rosa rubrifolia* makes this species attractive and interesting to many people, and it has proved hardy.

Rosa multiflora, of Thunberg, has sometimes had part of its branches killed, but is sufficiently hardy to bear an abundance of blossoms every season. In some situations it would probably be uninjured even so far north.

The Sweetbrier Rose (*R. rubiginosa*) must have been introduced to the vicinity of Montreal many years ago, as it has escaped from cultivation and is growing quite commonly and vigorously in some pastures. The pretty Japanese *Spiraea Thunbergii* appears to be quite hardy, and is a valuable addition to the shrubs. Some other foreign species of *Spiraea* do well, especially those which are natives of comparatively high latitudes.

The Caraganas from Russia and from Siberia are naturally perfectly hardy. *Caragana arborescens* and *C. frutescens* be-

come quite large shrubs, and, when laden with their yellow Pea-like blossoms, are quite ornamental, being, perhaps, the best yellow flowered shrubs to use as substitutes for the desired Laburnum.

Deutzia gracilis, being of dwarf habit, is usually well protected by snow, and rarely fails to blossom as well as at the Arboretum; but the large growing *Deutzia scabra* (also found in catalogues as *D. crenata*, *D. Japonica* and *D. Sieboldiana*), although it usually bears some flowers, is very liable to have its shoots killed in winter to within a foot or two from the surface of the ground. This also occurs about Boston, if the plants are situated in low or very moist ground, where growth is prolonged and the wood does not fully ripen before winter. In favored situations at the north it may prove quite hardy.

The common varieties of Mock Orange (*Philadelphus*) and the Tartarian Honeysuckles grow as luxuriantly as they do several hundred miles further south, and the Dutch Honeysuckle (*L. Periclymenum*) blooms freely every year if lowered from its trellis to the ground in the autumn and given a slight winter covering of leaves or branches where the snow does not remain.

The great-flowered form of *Hydrangea paniculata* does very well where the soil is not too wet and it is not forced to too vigorous growth; and some varieties of Weigela (*Diervilla*) are moderately hardy when grown under the same conditions.

Forsythia viridissima seems to do best when given a slight protection in winter—pegging to the ground being sufficient where it is covered by snow.

The Holly-leaved Mahonia (*Berberis Aquifolium*) is as badly winter killed as it is about Boston, and needs much protection from sudden changes of temperature in winter and from the consequent freezings and thawings. Plants of *Tamarix tetrandra* seem quite hardy, and have flowered freely though still small. Its hardiness is to be expected, as it is said to be a native of high latitudes and altitudes.

Most of the shrubs mentioned have received only partial protection from the snows of winter, and they have stood from twenty to twenty-five degrees below zero when there was very little or no snow on the ground.

Some of the smaller shrubs, such as the Flowering Almond, Woad-wax (*Genista tinctoria*), *Cytisus purpureus*, *C. nigricans*, *Euonymus nanus*, *Vinca minor*, etc., receiving more natural protection than the taller species, are hardy and satisfactory. Doubtless some seemingly half-hardy species may be grown in sheltered gardens of cities like Montreal and Quebec; but, in exposed places, soil and situation are as important as difference of degrees of latitude, and well drained ground and slow growth, leading to thorough ripening of wood, are the greatest protections many trees and shrubs require.

J. G. F.

Arnold Arboretum.

Vanda cœrulea.

THIS Vanda is undoubtedly the handsomest of the comparatively few blue-flowered Orchids. In former years it was rarely grown in such thrifty condition as it is now met with, and the failures with it were chiefly due to the great heat to which the plants were subjected. Coming from the Khasya Hills, where it is found at an altitude of from 3,000 to 4,000 feet, it naturally requires little heat and delights in a free circulation of air. The illustration on page 77 is from a photograph of a fine specimen in the collection of Mr. Hicks Arnold, of this city. It is in superb health, two feet high, and furnished to the bottom with perfect leaves. Last autumn it bore, on four spikes, fifty well developed flowers of a clear, azure blue color. The plant has been in Mr. Arnold's collection for two years, and has grown very rapidly. It is placed where it receives plenty of light and air, and that it thoroughly enjoys the position may be inferred from the numerous roots that show themselves outside the basket.

Foreign Correspondence.

London Letter.

THE enormous demand for flowers in winter in England is taken advantage of by foreigners in the same way as is the demand for fruits and similar commodities. In Italy, southern France, Spain, and even Algeria, the production of flowers for the English and other northern markets during winter has lately become an important industry. Besides these there are also large flower-farms in the Scilly Islands, where Grapes, Pears, early Potatoes and vegetables are largely grown solely for English consumption. The development of

the flower-farms in these islands is the subject of an interesting communication to the *Gardeners' Chronicle* by Mr. W. Roberts. When ordinary farming proved a poor business, market-gardening was tried, but it was not until about ten years ago that the cultivation of flowers for exportation was commenced in earnest. Enormous quantities of the flowers of Freesias, Anemones, Wallflowers, Roses and Persian Ranunculuses are now sent from these islands to England, and to the uninitiated are the cause of much wonder when seen on every stall and in every flower-dealer's window in February and March. But the flowers which are grown in greatest abundance, which find the readiest market, and which prove most profitable to the growers, are the Narcissi. Every available bit of ground is planted with the bulbs of these plants in various kinds, and from November right on to May they are the glory of the islands. The bulbs are planted from two to four inches deep and six inches apart; they are not matured, except by the decay of their own leaves. They are dug up, divided and replanted about every three years. It is supposed that \$1,250,000 is now invested by the Scillonians in these plants alone. Some 15,000 boxes of flowers of Narcissi are sent to England from these islands every year, as many as 500,000 spikes having been sent by one man in a single consignment. The spikes are tied in bundles of twelve and packed neatly in boxes. It is stated that during the winter season from ten to fifteen tons of cut flowers are sent to the English market from the Scilly Islands in a single day. By taking advantage of the English demand for flowers, and supplying such as carry and keep well, and which are popular, the inhabitants of these islands have shown how such a slight advantage as they possess in regard to climate, when compared with England, may be turned to the very best account. The market value of the flowers of these Narcissi varies from three pence to three shillings per bunch of twelve.

The following plants are now flowering freely at Kew in an unheated greenhouse, where early flowering tender alpine and herbaceous plants are accommodated. A house of this kind may easily be made one of the most charming features of the in-door garden during winter and spring. Hellebores, both of the Niger and Orientalis (or Lent Lily) sections, are abundantly represented by large masses crowded with flowers. *Hepatica triloba*, in white, purple and blue forms, two or even more colors sometimes occurring on the same plant, is conspicuous. *Milla uniflora* is a tuft of rich green leaves and numerous milk-white, star-shaped flowers. *Primula Fortunei* is the rarest and most interesting of the Primroses now in flower; it is in the way of *P. denticulata*, but has looser heads of lavender, yellow-eyed flowers. *P. obconica* is grown in quantity. The poisonous properties attributed to this species have never been experienced at Kew. Crocuses of many kinds and *Narcissus minimus*, with its delightful little trumpets, are other plants which now help to make this house one of the chief attractions at Kew.

ORCHIDS.—Public auction sales of these plants do not appear to be nearly so remunerative now as they were about twelve years ago, when those engaged in the work of collecting and importing Orchids were so few as to be able to practically control the market. Where there was one importer of Orchids in those days there are perhaps twenty now, and the consequence is that many of them find difficulty in getting their plants sold at anything like remunerative prices. In the early days, when Stevens, of Covent Garden, was the only auctioneer of Orchids, and when Low, Bull, and latterly Sander, were the only importers, it was nothing unusual for the whole expense of collecting and bringing to England a quantity of Orchids, with a handsome profit besides, to be realized at the first public sale. Then such prices as ten, twenty, fifty, and even one hundred guineas for a single specimen were not unusual. The game paid too well for it to long remain in the hands of a few, and now there are so many importers that a considerable proportion of them can scarcely make Orchid-importing pay. Although the cost of collecting and transporting these plants from distant lands is not now so great as it was a few years ago, yet an expedition to such countries as upper Burmah, Madagascar, New Guinea, or even to some parts of South America, requires an outlay of some hundreds of pounds, not to reckon the risks to the health and even to the lives of the collectors, before a quantity of plants are landed safely in England. Even then it is not an uncommon occurrence for nearly all of the plants to be dead on arrival or too sick to recover. Only this week I have learned of a case of this kind. A well known and very successful importer informed me that a lot of Orchids from Central America, which recently arrived in good condition, was the third attempt to get these plants home alive, two previous attempts having proved complete failures,

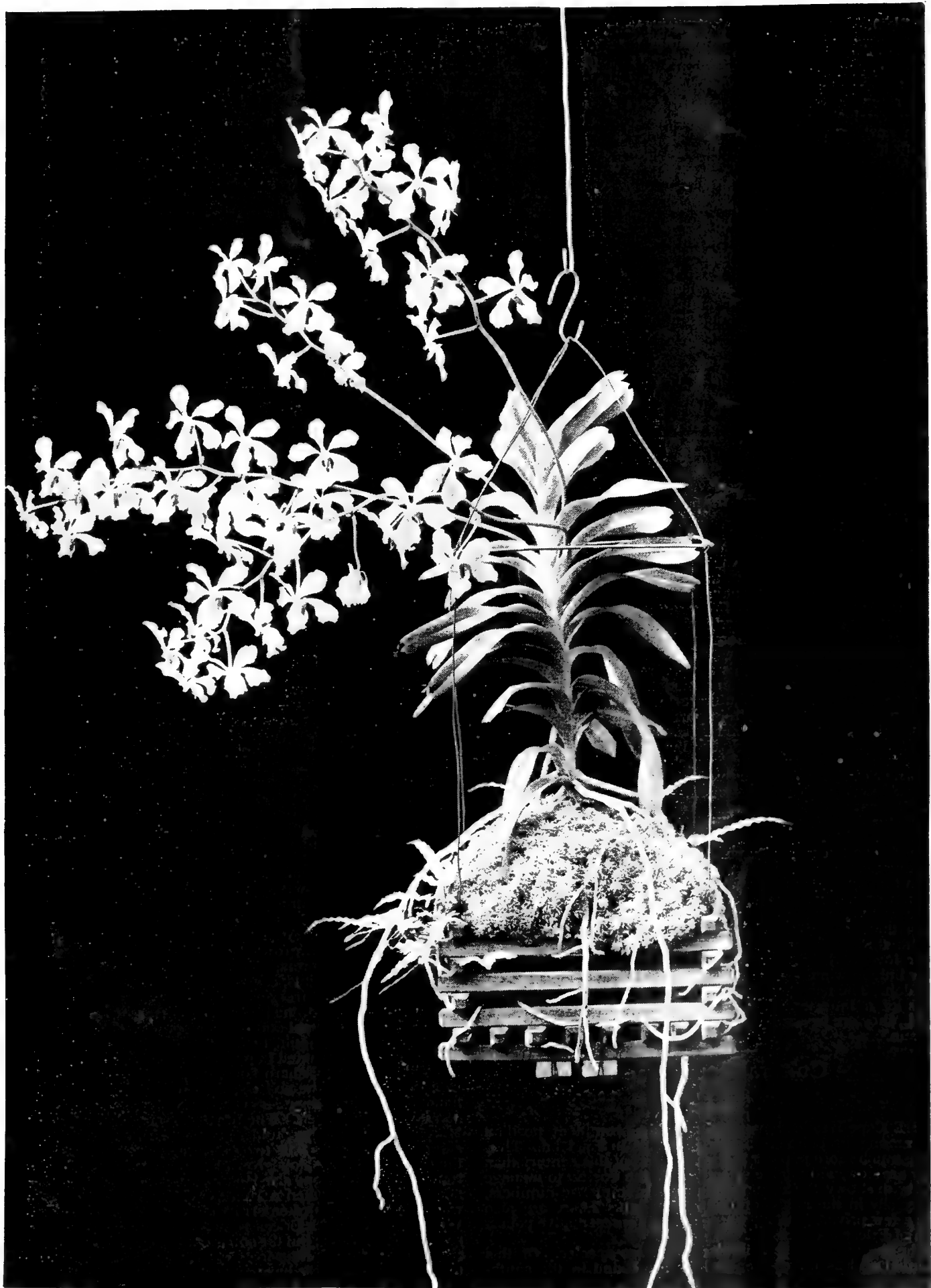


Fig. 17.—*Vanda coerulea*.—See page 76.

although each one was as expensive as the last. And now comes the disheartening part. These plants, obtained at such an outlay, when placed in the market have not realized anything like the sum spent in collecting and importing them, apart altogether from losses on the other attempts. Another similar case is that of Mr. Wallace, of Colchester, who has just returned from collecting in tropical west Africa, and has succeeded in bringing to England about sixty plants of an *Angræcum* new to cultivation, and a very fine thing. These sixty plants are all that survived of some thousands collected. In the auction rooms the prices these rare Orchids brought were absurdly low; I do not think they would more than pay the cost of packing and freight. Again, it sometimes happens that on the eve of a sale of an importation of Orchids information of a second, or even third, importation is made public. People who are astonished at the exceptional value of an Orchid, do not take into consideration the difficulties and cost of bringing the plants to England. Many of them are as rare and as difficult to get at as diamonds.

Angræcum pallidum.—This is the Orchid which Mr. Wallace, of Colchester, has just brought from the west coast of Africa and offered for sale at the auction-rooms this week. It has fleshy, strap-shaped, distichous leaves nearly two feet long, two and a half inches wide in the broadest part and shining green, and is in the way of, but larger than, *A. pellucidum*. The flowers are produced on thin spikes two feet or more long, some of the imported plants showing no less than thirty dried spikes; each spike bears about sixty flowers, which are creamy white, almost transparent, apparently about as large as those of *A. Sanderianum*. In bloom the plants are said to present a grand appearance. Judging by the imported plants, I should say that *A. pallidum* is a gigantic *A. hyaloides*, which is peculiar amongst cultivated *Angræcums* in producing erect spikes of white flowers in great profusion from the base of the plant. If *A. pallidum* proves amenable to ordinary stove treatment—and there is no reason to doubt that it will do so, since the other tropical African *Angræcums* are easy to cultivate—it will be a valuable addition to the already numerous species of this genus now in cultivation.

Maxillaria Sanderiana.—Hitherto this plant has been very rare, only one or two growers having saved plants of an importation of Mr. Sander's some six years ago. Probably excessive heat caused the death of most of the plants, the general belief being that this species required tropical treatment. It is happiest in an intermediate house, or say, along with Cattleyas. Messrs. Shuttleworth, Cardes & Co., of Clapham, have just succeeded in importing a good lot of this species, so that it should henceforth be as popular as other *Maxillarias*. It is one of the very best of the genus, having flowers as large and of as much substance as those of *Lycaste Skinneri*; they are five inches across, pure white, the lip and lower part of the segments deep crimson. The species is a native of Peru.

Cypripedium Godefroyæ.—When first introduced some seven years ago this pretty little species found many purchasers at from five to ten guineas a plant. This week I saw it sold at the auction rooms, newly imported plants in fine condition, at from three pence to six pence per plant. Most growers prefer the newer and handsomer *C. bellatulum*, a near relative if not actually a variety of the former. In England it is not easy to keep these and other *Cypripediums* of this section in good health during the winter; they are singular in the genus in their love of bright sunshine, of which we have, as a rule, very little in winter—at any rate, in the near neighborhood of London. The natural conditions for *C. Godefroyæ* are "on the cliffs of a limestone island, where, after about ten o'clock A. M., they are exposed till sunset to the full glare of a tropical sun."

London.

W. Watson.

Cultural Department.

Ericas.

THE Cape Heaths have always held a prominent position among greenhouse flowering plants in England. They were much more popular in the early part of this century than they are now, although a select few of the easiest to manage and with showy flowers are still grown in immense numbers, especially in the neighborhood of London. There are also still a few private gardens where a good representative collection of *Ericas* is cultivated.

The genus is said to comprise some 400 species. Of this number no less than seven-eighths are found in the southwestern region of the Cape. This region is an angular littoral strip, extending from Port Elizabeth to Oliphants' River and

with an average width of fifty miles. Nearly all the best of garden plants from south Africa are found here. The showiest of the *Ericas* are, according to Bolus, found on the mountains; *E. cerinthoides*, *E. mammosa*, *E. coccinea*, *E. spumosa* and *E. hirta* being the most abundant; the last named making whole mountain-sides glow with its warm pink-colored flowers. In England a similar effect is produced by the rich glowing purple of our native Heather, which covers miles of moor and hill-side.

According to Aiton there were close upon 200 species of Cape *Ericas* in cultivation here in 1810; about half of this number having been sent home by Francis Masson, who collected at the Cape for Kew. Loudon, in the "*Hortus Britannicus*," enumerates no less than 565 species, so called, as having been cultivated in England, 348 of which were figured in the *Botanical Magazine*, Andrews' "Heathery" and other works. The position in horticulture held at that time by these plants was evidently an exceptional one.

The art of cultivating Cape Heaths appears to have been acquired in England almost from the date of their first introduction. Specimen plants six feet through and as many high, in splendid health and full of bloom, were common features at plant exhibitions forty or fifty years ago, and now and again such specimens are to be seen in English collections to-day. Whether some peculiarity of climate or other conditions favors the growth of these plants in England and Scotland, it would be difficult to say, but certainly in no other country, not even at the Cape itself, are such specimens of *Ericas* to be seen as are produced by cultivation in England. The principal introducers and dealers in Cape Heaths in England were, after Kew, Messrs. Lee & Kennedy, Low, Rollisson, and Fraser. In addition to the species, a large number of hybrids and seedling varieties were raised in England, chiefly by Rollisson, Turnbull, Marnock and the McNabs. Many of these eventually superseded the species, and to-day one may safely say that of the *Ericas* represented in English gardens considerably more than half are hybrids of garden origin. It has been computed that of species, hybrids and varieties something like one thousand kinds of *Erica* have been known and grown here.

The Kew collection of these plants contains probably every one of the true species in cultivation in England and a good number of the hybrids and varieties. Altogether they number 142.

The beautiful colors, elegance of form and other charms of many species of Cape *Ericas* are, to some extent, depicted in the large edition of Andrews' "Heathery." These drawings, however, beautiful though they are, fail to convey any idea of the ornamental character of well grown specimens when well flowered. Such kinds as those mentioned at the end of this paper have very few equals among greenhouse flowering plants. *Ericas*, when properly treated, flower very freely, and their blooms remain fresh a long time, either when cut or when left on the plants. Many of them flower at a time when they are of exceptional value. No well furnished conservatory in winter can fail to show plants of such kinds as *E. hyemalis*, *E. colorans*, *E. hybrida* and *E. persoluta*. By selecting the plants according to their flowering season, one might easily have a few examples in flower at all times in the year.

The cultivation of Cape Heaths is not nearly so difficult as is popularly supposed. Where their requirements are properly understood they are grown by the thousand, by men of the rank of garden laborers. They are all what are here termed cool greenhouse plants, requiring a minimum temperature a few degrees above freezing point, and during hot weather exposure to full sunshine in the open. When under glass they must have an abundant and regular supply of fresh air; the atmosphere also should be kept as dry as possible. They thrive only when planted in good rich peat, made very porous by adding plenty of sharp silver sand. The pots should be well drained, and the soil made as firm as possible with the hand. Potting sticks, unless very carefully used, are often the source of much injury. The time to repot is from January to March. Free-growing kinds, such as *E. hyemalis*, may be shifted annually into pots two or three sizes larger than those they are in; but the slow-growing, hard wooded kinds do not require more than one size larger each year. From the mistaken belief that when a Heath dies it is the result of over-watering, beginners often err by keeping their plants too dry. When in good health *Ericas* require as much moisture at the root as most plants; but the soil must be kept sweet and never allowed to become water-logged. Avoid extremes in regard to watering and *Ericas* have what they require. During summer the free-growing kinds should be watered occasionally with weak manure water.

Ericas often grow leggy and thin because they have not been cut back or stopped sufficiently. The hard-wooded kinds should have the points of their strongest shoots removed soon after the flowers are over and growth has started again; the soft-wooded kinds should be cut back hard a few weeks before they are repotted, and kept a little warmer until they break. Mildew is the greatest enemy of these plants; it may be kept under by means of sulphur. Prevention is, however, better than cure, and if the plants are well supplied with fresh dry air they will not suffer much from mildew.

A selection of the best of the Ericas now known in gardens would include the following:

Soft-wooded.—*E. Caffra*, *E. Cavendishiana*, *E. cerinthoides*, *E. colorans*, *E. Eweriana*, *E. gracilis*, *E. grandinosa*, *E. hybrida*, *E. hyemalis*, *E. melanthera*, *E. perspicua*, *E. persoluta*, *E. ventricosa*, vars., and *E. Wilmoreana*.

Hard-wooded.—*E. Aitoniana*, *E. ampullacea*, vars., *E. Devoniana*, *E. effusa*, *E. eximea*, *E. Fairieana*, *E. Jacksoniana*, *E. jasminiflora*, *E. Kingstonsiensis*, *E. McNabiana*, *E. Mas-*

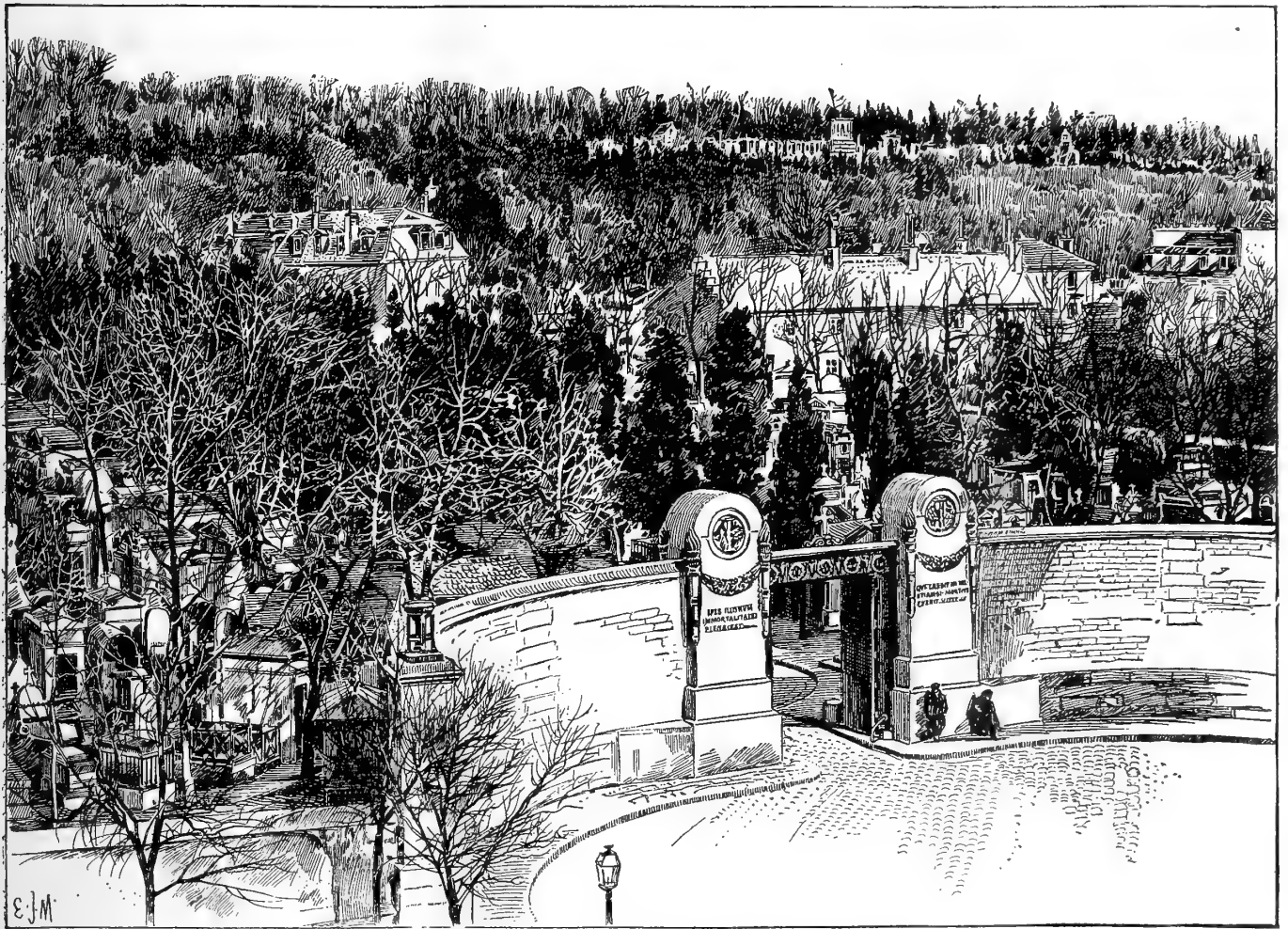
stem three feet in height it is certain to be dead on the south side of the stem in three years. But top-worked on the Asiatic species (*Elæagnus angustifolia*), even at a height of six feet its stem will remain perfect. Of this we have examples, in many directions. In fruits some varieties fail in stem which are perfect in top. In such cases top-working on stocks that are proof against sun and wind is an evident advantage.

Top-working is an advantage in another way on our extremely varied soils. As an instance, the Gros Pomier Apple does remarkably well on sandy land where many sorts utterly fail. Working the sorts that fail on sand on this stock seems to meet with success.

Again, the Tetofsky Apple does well on low, wet prairie land where most other sorts fail, and experience has shown an advantage in using it as a stock on such soils. In Silesia this adaptation of fruit-tree stocks to varied soils has reached greater perfection than in any country of which I have information.

Iowa Agricultural College.

J. L. Budd.



The Entrance to Père-Lachaise Cemetery.—See page 74.

soni, *E. Marnockiana*, *E. ovata*, *E. retorta*, *E. Shannoniana*, *E. tricolor*, vars., *E. vestita*, and *E. Victoria-Reginæ*.

These would form a good collection to begin with. Probably a hundred kinds, all first-class flowering plants for the greenhouse, could be got together even now, for there are still a few nurserymen in England who grow a good collection of Cape Heaths.

Kew.

W.

Grafting.—There is no proof that a tree which is liable to injury in our trying climate can be made hardier by grafting it on an iron-clad stock, but top-working is of advantage in more than one way. In our interior climate, trees doing well under forest conditions as to shade of stem may utterly fail when the stems are exposed to the direct rays of the sun and hot south-west winds when isolated on the open prairie. As an instance, the Buffalo berry (*Shepherdia argentea*) is plentiful on the banks of the upper Missouri, growing thickly like Hazel brush; but when planted by itself in our yards with a

Perennial Pyrethrums.—There are few hardy plants that have lent themselves so kindly to the skillful manipulation of the florist and been so obviously improved thereby as the parent of this useful race of hardy plants, *Pyrethrum roseum*. Indeed it is a mystery how, from this, the original species, a pretty thing in itself, much resembling a rose-colored Ox-eye Daisy, such beautiful varieties have been obtained, notably the one with large, double white flowers with not a tinge of color to mar their snowy purity and others of the brightest crimson and all the various shades between the two. Their cultivation is extremely simple, as it is only necessary to plant them in good soil well enriched and leave them alone, to become possessed of fine strong clumps, and it is from these that good and satisfactory results may be anticipated. The flowering period of these Pyrethrums extends over the whole of the summer season, and this is a trait worthy of special notice when one considers the durability of the flowers in a cut state. When it is desired to increase the stock of plants none but strong clumps should be selected for this purpose, and the

operation is best performed in spring, as early as possible, when the plants may be taken up, care being taken to secure roots to each portion of the plant. These may then be replanted and the operation will prove beneficial if carefully performed. Pyrethrums may also be easily raised from seed if it is fresh and of a good strain, such as sent out by the large European seed-growers. All of the plants will not produce double flowers, still the single ones are exceedingly pretty and useful, and indeed some growers are making a specialty of single varieties. Some of the older double varieties named below are still as good as any that can be found either in catalogues or gardens. The two best white varieties are Mount Blanc and White Aster, while Captain Nares, Emilie Lemoine and Progress are among the best reds, and Ne plus ultra, Iveryana, Dr. Livingstone and La Vestal are all good shades of pink and lilac; J. N. Swerdy is a brilliant red and good. All of these we have grown and find them as good as the best. Each year adds new kinds to the already long list.

Passaic, N. J.

O.

Perennials from Seed.—III.

AFTER the seeds have germinated and are large enough to handle—that is, when there are at least two fully developed leaves besides the seed-leaves—the time has arrived for transplanting or pricking out into boxes or pots. This is a critical period in the life of the plant, and inattention then often results in a weak or spindly growth, which necessitates weeks of nursing and care to strengthen and enable it to stand the hot sun sufficiently to bear planting out permanently. This is especially true when, as sometimes happens, the seeds come up thickly in the pan. If the rougher portion of the soil has been used as drainage to the seed-pan, the young plants can be separated easily without injury to a single root, but when moss or leaves are used there is great difficulty in disentangling the roots, and the young seedlings receive a severe check. Three-inch pots are the most suitable size if the plants are, of strong, robust habit, such as Delphinium, Coreopsis, Hollyhock, Papaver and Lathyrus. In pots of this size the young plants will grow strong and form a mass of roots that will defy any period of dry weather that may ensue if they are well watered before planting. The best soil is two-thirds good loam and one-third leaf-mould. Should the plants be naturally tender-rooted, it is best to place them at the side of the pot instead of in the centre, for the young roots love to feel the side of the pot, and when they find the way around it is the time when the plant seems to enjoy life the most. For all small, dwarf-growing plants of alpine character two-inch pots are large enough. After potting, the young plants will need careful watering, although water should never be given until they really need it, and during bright sunshine a sheet of newspaper should be thrown over them until they have become well established. The temperature should be the same as that in which the seeds were raised—fifty-five to sixty degrees by day and fifty by night—until the plants have filled the pots with roots, when they may be kept cooler and gradually hardened off. The final planting out may be done as soon as possible after the departure of frost and when the soil is in good working order. Their permanent places should be determined beforehand, and the soil made rich with fine manure. Where large collections of hardy plants are grown it is always found best to set apart a piece of ground, away from the flower-garden proper, for use as a reserve ground or nursery, where seedlings can be cared for until they reach their normal size and strength. From this they may be moved to any desired situation without any fear as to their ultimate success. This is a plan that should be adopted by all who can spare the space, for gaps are sure to occur in the borders every season, and one has only to turn to the reserve ground to fill them all up, and if a friend wishes to exchange, a young thrifty plant is always available for that purpose. Should any new or rare plants be received, and they are planted among established plants, the food provided for their nourishment is speedily devoured by their hungry neighbors, whereas if nursed by themselves, with others newly planted, all have an equal chance. The reserve ground will be found useful, too, when cut flowers are wanted, and this saves the border from depletion. When planting we make a trench with the spade, put manure in the bottom, and cover with an inch or so of soil. Then we place the plant against the side of the trench, and if the roots have not been confined in a pot we spread them out and cover first with the finer soil, and when sufficient soil is in, press sidewise with the foot until it is firm. When the roots start they will be attracted downward by the manure, where they will remain out of the reach of harm from dry weather or other trying climatic con-

ditions. When the plants have balls of soil attached to the roots they may be planted in the same way, but care should be taken that the balls of soil are not broken. When treated as we have advised hardy perennials may be raised from seed as easily as annuals, and there is no reason why they should not be grown in every garden.

Passaic, N. J.

E. O. Orpet.

Orchid Notes.

Oncidium curtum.—It is not often one meets with this remarkably showy species in cultivation, and perhaps less often it is seen in a fine condition. When well grown it is the equal of such handsome and popular plants as *O. Gardneri*, *O. crispum* and *O. prae-textum*, and is one of the most attractive *Oncidiums* known.

The "crop-eared" *Oncidium*, as Dr. Lindley designates *O. curtum*, first found its way into cultivation in the year 1847 through Messrs. Veitch, of Exeter, through whom it first flowered, but who at the time gave no information respecting its native country. After this it appears to have become very scarce or altogether lost; and it is only of late years that it has been imported from Brazil, but still not in large quantities.

The botanical characteristics of *O. curtum* are its oblong-ovoid, much compressed pseudo-bulbs, which become more or less furrowed with age. One or two oblong-lanceolate leaves are borne on the summit of each, and from the base arises the branching scape, which attains a length of one and a half to two and a half or more feet. Several flowers closely arranged are produced, and measure about two inches across. The upper sepal is oblong-elliptic, wavy, with a few transverse rich brown blotches on a pale, greenish yellow ground. The two lower sepals are connate beyond the middle, and are colored and blotched like the upper one. The broadly obovate petals are rich chestnut-brown, with a conspicuous, irregular border of bright yellow. This latter color predominates in the large reniform lip, which is deeply cleft in the centre, and adorned with a row or two of irregularly shaped chestnut-brown blotches all round the undulated margin. At the base is a dark red-brown zone surrounding the dark purple-warty protuberances which form the crest, on each side of which is a golden yellow auricle.

During December last several good specimens of this species were flowering here, some of them carrying as many as sixty and seventy blooms on a spike; but the average number was about thirty. This is not the usual season, however, for *O. curtum* to produce its flowers, but about April and May. The plants in question were imported ones, and flowered from their native pseudo-bulbs. Plants which have been thoroughly established in cultivation begin to make new pseudo-bulbs in January, and as the weather becomes more genial the growth becomes more rapid, and is fully made about June or July, after which they begin to ripen. Up till this time the plants may be freely watered, beginning with small quantities and gradually increasing them according to the vigor of the growth. As the winter approaches the supply of water is gradually diminished, until the plants require very little, and at rare intervals. The temperature during this latter season may vary from sixty to sixty-five degrees Fahr., rising to seventy to seventy-five degrees in the summer months.

St. Albans, England.

John Weathers.

Miltonia cuneata is a very desirable Orchid, belonging to a much neglected genus, if we except those species that until recently were called *Odontoglossums*. The subject of this note has been known to gardens since 1843, in which year it was introduced from Mexico. This plant evidently enjoys great heat and much water during the growing season, and it thrives best in small baskets, with very little potting compost, which may consist of very sandy peat. It is an erect growing plant, with conical bulbs, and pale green, thin, leathery leaves about a foot long. The erect scapes spring from each side of the base of the bulb, and bear seven to nine handsome flowers distantly placed along each side of the rachis. The narrow sepals and petals are dark chocolate, tipped and barred with yellowish green; the wedge-shaped lip is pure white, tinged with pink near the base. The flowers last quite a long time in water, and are very suitable for cutting.

Kenwood, N. Y.

F. Goldring.

Anemone blanda and *Iris Bakeriana*—Both these are excellent winter-blooming plants. If potted at intervals from August to September and housed afterward in a greenhouse they may be had in flower from November to February. *Anemone blanda*, a near relative of *A. Apennina*, is a native of the Levant, and has the advantage over the latter of flowering

in the open air, four or five weeks earlier—that is, about the second week in March—with me. The plants form a low mass of palmate, much-divided leaves, and the deep blue flowers are from three-fourths of an inch to an inch in diameter. *Iris Bakeriana*, a native of Kurdistan, was introduced by me only two years ago. Treated in the same way as the Anemone, it will flower at the same time. It is a near relative of *I. reticulata*, has lavender standards, white falls blotched with blue, and a deep blue-black tongue. It is powerfully violet-scented when the sun shines upon it, and is very beautiful on account of the harmonious coloring of the flower.

Baden-Baden.

Max Leichtlin.

Correspondence.

Forestry Matters in New Hampshire.

To the Editor of GARDEN AND FOREST :

Sir.—The Forestry Commission has held two public hearings—one at Littleton, in the heart of the mountain summer resort region, the other in Manchester, the largest city of the state. The leading men of Littleton attended, with many from adjacent towns, and there was a large and spirited meeting. After brief addresses by members of the Commission there was a general expression of interest in the preservation of the forest scenery as the chief attraction for summer visitors. The importance of good roads and of keeping the roadsides and adjacent forests in an attractive condition was urged, and a plan was suggested for the employment of an equipped organization of firemen in each town, under the direction of a state officer, the men to be paid when in actual service fighting forest fires. Most of those present seemed to think favorably of judicious and limited action by the state, but the main emphasis was upon the necessity of individual effort and the importance of action by the towns of the region in improving the local conditions, and thus making the mountain country more interesting and agreeable to visitors.

Some of the men who had all their lives been familiar with the mountain woods, emphasized the fact that fishing is one of the principal attractions for many men from the cities, and that cutting off the forest at once puts an end to the fishing throughout the area thus uncovered. As the fish can live and thrive only in the shade, they leave the streams at once when the sun is let in and warms the water.

At Manchester the manufacturers, merchants, lawyers, bankers and newspaper men of the city were well represented, and there were many farmers from remote towns. Some of these had had experience in tree planting, and the meeting was much interested in their description of methods and results. The love of trees and feeling of delight in them, without which it is so difficult to do anything in forestry matters, was very manifest at this hearing, and if those who are thus vitally interested can be brought into co-operation with each other something may be accomplished.

There is more intellectual movement in New Hampshire of late than for many years before, more thought about the general interests of the people of the state. The agitation regarding forestry subjects and the discussion about abandoned farms mutually stimulate each other. It happens that circumstances bring home to us here with unusual directness the close relation between good taste, beautiful scenery and the qualities of an advanced civilization on the one hand, and the means of subsistence on the other. This is the situation in briefest terms—while our mountain forest-scenery is preserved it attracts multitudes of visitors, and sustains a summer resort business which brings into the state perhaps two millions of dollars every year. This revenue goes into general circulation and thus benefits the whole state. But if the forests are destroyed there will be no beauty or attraction here for anybody. The tourists and boarders will go elsewhere, and our mountain hotel property will be worthless.

But the owners of forest-lands do not keep boarders; they depend on the sale of their timber for their means of subsistence. So here are conflicting interests. The only way out that appears practicable is for the lumbermen to cut off the woods by an orderly method and system, not all at once, "smack and smooth," as the axeman's phrase is, but by taking out the large timber and leaving all below a certain size to grow for another crop. Handled in this way the forests will yield perpetual revenues. The lumbermen can be always cutting, and yet forest conditions will never be destroyed. The ineffable charm of the mountain scenery will be permanent. The myriads of visitors will return year after year, and successive generations of their families will seek a summer dwelling among our hills.

The danger is that we shall not adequately appreciate the necessity of popular education in the broadest sense of the term, of the general propagation of right ideas regarding the facts of the case, and all the interests and relations involved. It is indispensable that the lumbermen and owners of timber lands should be engaged and interested in the movement for the preservation of forest conditions in the White Mountain region. The lumberman's right under the law to do what he will with his own is invincible. If he should not help us, but stand stubbornly on his right to cut off his own timber in his own way, and to make a desert of his own domain if he chooses, we should accomplish very little. We must secure his co-operation, or the practical results of our efforts will be but slight.

Franklin Falls, N. H.

J. B. Harrison.

A Late African Novelty.

To the Editor of GARDEN AND FOREST :

Sir.—I notice in your excellent paper for January 29th an account of that much bespoken novelty, *Kalanchoe carnea*, which impels me to say that a reasonably extensive experience leads me to consider it one of the least satisfactory introductions of the last thirty years. Beauty is not a quality either of its flowers or its foliage. The color of both is washed out and mawkish, the perfume of the flowers is agreeable but weak, though of the many exaggerated statements that have been circulated concerning the plant, the common account of its fragrance is perhaps the least beyond the truth.

I enclose a photograph of the plants of *Kalanchoe* that have been cultivated in my greenhouses, so that you can see that I do not speak without knowledge; and my advice to other cultivators is to choose some other subject for hope and experiment.

New York.

C. A. Dana.

Spanish Moss in Northern Tennessee.

To the Editor of GARDEN AND FOREST :

Sir.—In August of last year, while engaged in geological work along the Cumberland River, I came across a locality where the beautiful, pendent tufts of *Tillandsia usneoides* abound. It is on the face of a great limestone bluff which overhangs the river, and has a full southern exposure. The bluff, known to boatmen as the "Checkered House Bluff," is something more than two miles below Cumberland City, in Stewart County, Tennessee, and about fifty miles a little north of west from Nashville. The face of the bluff has a scattered growth of Cedar, Oak and other plants upon it, and the trees over a large area are richly ornamented with the drapery of this hanging and luxuriant plant.

Vanderbilt University, Nashville, Tenn.

J. M. Safford.

Vegetables Under Glass in New Jersey.

To the Editor of GARDEN AND FOREST :

Sir.—It is not an easy matter to find Jobstown on the map of New Jersey, although the place has been made famous for years by the Rancocas stock-farm, from which Parole, Iroquois and many another thoroughbred has gone out to carry the Lorillard colors to victory. The visitor who is now so fortunate as to be shown through the great stables by McLaughlin will find the day too short to listen to the history of the purple-blooded celebrities in their stalls and watch the graceful movements of the youngsters at their exercise. There is not so much to stir the blood in the greenhouses, which stretch away in a continuous line for nearly 1,000 feet, but in them one can see what is perhaps the most successful experiment in this country, on a scale of such magnitude, in raising vegetables for market under glass. This business is carried on by Mr. John G. Gardner, who was the gardener in charge of the establishment here, when it was the custom to furnish its owners in their city home with melons, pineapples and strawberries, green corn and peas—in short, from twelve to fifteen kinds of "home-grown" fruit and vegetables for Christmas dinner. Mr. Gardner now rents the houses and turns his experience and skill to good account in producing fruits and vegetables of the highest quality, and commanding, of course, the highest prices.

It was on the 5th of February when I made my pilgrimage to Jobstown, but the Swamp Maples were red with bloom on the banks of the Delaware; the narrow ribbon of green grass along the water-courses was broadening out and invading the brown stubble in the meadows, and forehanded farmers were plowing in the uplands. As I stepped from the cars I heard

the meadow larks singing, and April was everywhere, stirring all the life in the ground and in the air. Some Nectarine-trees in sunken pots were ready to burst into bloom, and I inquired of Mr. Gardner whether he did not fear the consequences if freezing weather should suddenly come; but he pointed out that on all these flowering shoots there were enough buds, still dormant, to ensure a crop if the precocious ones should freeze; and this explains why so many car-loads of Peaches come to market from Delaware after a serious frost when the buds are swollen has seemed to justify the prophecy that the crop is ruined. These Nectarines in pots, by the way, show what the houses will be called upon to do a little later on. In a general way it may be said that the business here is the growing of Tomatoes and Mushrooms in winter, with Grapes, Figs, Nectarines and Peaches as summer crops. Of course other vegetables are grown, but the Tomatoes and Mushrooms are the main crops.

Many details of the cultural practice here have already been given in GARDEN AND FOREST (vol. ii., p. 5), but the ability to grow good crops under glass is only one of the qualifications for success in the business. The producer must know his markets, and know just what will pay best at a given time, and while having his crops ready in their due season he must arrange for succession in his houses so that the entire space is constantly utilized to the best advantage. In no two of the houses are the rotations exactly alike. In one of the long pits outside, for example, I observed a row of thrifty Tomatoes, just showing bloom, a row of Beans just starting in a long trough-like box extending through the middle of the pit, while pots of *Adiantum cuneatum* were set closely on the front wall. A crop of Cucumbers and one of Asparagus had already been grown in the same pit—the Cucumbers first, trained along under the glass, and the Asparagus roots on the bottom. One large house was filled with tall Tomato plants, trained to a single stem and running up a cord to the roof. They were still bearing well, but would soon give place to other Tomato plants which are now three weeks old. In this house are Vines permanently planted, from which the grapes were cut in November. They were then pruned, laid down and boxed in, to keep them cool and dark before the Tomatoes now bearing were brought into their present position. In April these Vines will be lifted to their places to start, and the second crop of Tomatoes will all have been gathered before the foliage of the Vines shades them injuriously. In another house, where the second crop of Peas is nearly marketed, and where the temperature has been kept low, heat is now gradually admitted, to start the buds of Nectarines, grafted on Plum stock and trained fan-shape along the roof. In another house still, where the first crop of Tomatoes began to yield in November, a second crop is now setting fruit, and after this is marketed the house will be occupied with Figs. These are examples of rotation in different houses; and there will always be a fresh lot of plants ready to take the place of an exhausted crop until the last pot is brought in with a Peach-tree or Grape-vine for the summer.

Mushrooms are growing everywhere in unexpected places, not only in the regulation, deep, dark cellar, but in the side pits, under the staging of the cool houses, and even in the warm houses, where the shutters over the beds are covered thickly with straw for the unusual purpose of keeping the heat out. No Asparagus is now being forced, and the roots are all thrown out. This year the southern Asparagus appeared in New York as early as the 25th of January, and, of course, this arrival breaks the market at once. The increasing competition from the south makes it necessary to know what is going on there every year, so that the grower here can adapt himself to the changing situation. It would not have paid to grow Strawberries for the last holiday season, when Florida was in the market with good berries by Christmas. Hot-house berries grown at that season are necessarily expensive when the days are short, and perhaps dark and foggy; and so few people are willing to pay five dollars a box for berries, that a consignment of fifty boxes will overstock the market. Strawberries at a dollar a basket in March or April are much more profitable, for they are more easily grown in the longer and brighter days, and while the buyers are few who will think of paying five dollars, many a one will take the berries at a dollar or a dollar and a half a basket when southern berries are selling for ten cents a quart. Of course the hot-house berries are better in color, form and flavor than any out-door berry can be after long carriage. It was in preparation for this spring demand that the fine Strawberry-plants, now just coming into bloom here, were layered about the 20th of last July. In August they were potted, and the strong, well developed, single crowns promise an abundant yield. Sharpless is the variety which Mr.

Gardner prizes most highly. While on the subject of varieties it may be said that Sion House is the kind of Snap Bean planted generally here. It gives a crop in six weeks from seed, the pod is of fine size and of a deliciously sweet flavor. Rollinson's Telegraph is the frame Cucumber preferred.

No variety of Tomato has been found superior to the Lorillard, which originated here from seed of Perfection fertilized with pollen from Acme. The plants have been kept pure by raising them from cuttings up till the present year. The good points of this Tomato are, its uniformity of size, good color and shape, rich flavor, and a solidity which continues till the fruit is well ripened. The plant, too, has a strong constitution. Ignotum has a good, bright scarlet color, but it lacks uniformity. An Ignotum tomato that will weigh a pound is not uncommon, but many of them are corrugated. The Lorillard will average three or four to the pound, and tomatoes of this size, especially when all are round and smooth, sell more readily than those which weigh from half a pound to a pound. Of the Ignotum, only one out of five will prove of good form, while of the Lorillard nearly four out of five will be of perfect shape. Perfection may be named as the second best Tomato for forcing. Paragon would be valuable, but it fails to color about the stem. Four Tomato plants are grown in a box two feet long and eighteen inches wide, as was described in the article before alluded to. I noted that where the roof was low and the plants had a height of about four feet, the yield had averaged fifteen tomatoes to the plant, or say fifteen pounds to each box. Where the plants had room to grow about six feet high, each vine averaged twenty-six to twenty-seven tomatoes, or, since they were somewhat larger than the others, thirty pounds to the box. A fair wholesale price would be fifty cents a pound. The plants begin to yield about ninety days from the seed.

Mr. Gardner finds the market for winter vegetables enlarging every year. The number of growers are multiplying still more rapidly, however, and success can only be won by the best cultural practice, the widest knowledge of the demands of the market, and the alertness and enterprise to occupy new fields promptly.

"What are you doing with so many Grape-vines in pots?" I asked, when about to leave.

"They are Black Hamburgs, and I sell a good many. You see they will all bear a fair crop this year. When a man builds a grapery he does not like to wait three or four years before he gathers fruit. These potted vines can be set in between his permanent vines, and give almost immediate returns. Since they are to be discarded it is not bad practice to let them bear heavily now. Those which I do not sell can be made to yield me paying crops."

S.
Jobstown, N. J.

Recent Publications.

Manual of the Botany of the Northern United States, including the district east of the Mississippi and north of North Carolina and Tennessee. By Asa Gray. Sixth edition, revised and extended westward to the one hundredth meridian by Sereno Watson and John M. Coulter, with twenty-five plates, illustrating the Sedges, Grasses, Ferns, etc. Ivison, Blakeman & Co., New York and Chicago, 1890.

The fifth and last edition of "Gray's Manual" appeared in 1867. A great advance has been made during the twenty-seven years which have elapsed since its publication in the knowledge of the plants of the region it covered; and the want of a new edition to contain the results of the author's own investigations and those of a number of botanists in different parts of the country, whose early botanical inspirations were largely derived from the early editions of this very work, the constant companion for more than forty years of every one who has studied the flora of eastern America during that time, has long been felt. Professor Gray himself proposed at different periods during the last part of his life to snatch the time from the more important "Synoptical Flora of North America" for a new edition of his Manual, but just the right time never came, and it has been left to Mr. Watson, and his associate, Professor Coulter, to produce, with such assistance as was available, this new and greatly improved Manual. The original plan of the work, so long adhered to and of such general acceptance, has been retained, but the territory covered in the old edition has been extended westward to the one hundredth meridian of longitude—that is, to the western limits of our true Atlantic flora. This change and the insertion of such plants of the old region as are now first included in the Manual increases the bulk of the volume by only fifty-seven pages, and therefore does not take away from its value as a book for field reference. The work seems to be admirably done, and so far

as we have been able to examine it, absolutely free from those annoying typographical errors which it is well nigh impossible to eliminate from a book of this character.

Botanists who believe in the strict application of the law of priority in matters of nomenclature will not derive much comfort from Mr. Watson's decisions in such matters, as they appear in this volume; and they will regret that the fulfillment of their hope for a stable nomenclature for plants, as regards both generic and specific names, must be delayed in this country, at least, by the system adopted in a work which will, of necessity, influence for many years the opinions of the students of botany in the United States. But the authors of the new Manual, in their decision that the specific name first given to a plant, when referred correctly to its genus, is the correct specific name for it, although it may have had a much earlier one in another genus, have the support of many of the most distinguished naturalists of this and of the last generation. The name, however, is not by any means the most important part of the plant; and the object of the Manual is to enable any one finding a plant growing in wood or meadow to identify it readily, and to learn something of its affinities and history. No book ever published fulfilled this object better than "Gray's Manual," which will gain in usefulness and reputation in this new edition, for which the authors will receive the thanks of every one interested in American plants.

Mr. Watson acknowledges the assistance of Mr. S. B. Bebb, of Illinois, who has rewritten the genus *Salix* for this edition; of Professor L. H. Bailey, who has elaborated the difficult genus *Carex*, and of Professor D. C. Eaton, who is the author, as he was in some of the previous editions, of the part of the volume devoted to the Ferns and allied orders. The increasing interest taken in this country in the study of cellular Cryptogams has led to the inclusion of the *Hepaticæ*, omitted in the last edition, and now described by Professor L. M. Underwood. A glossary of botanical terms is appended to the volume, besides a Synopsis of the Natural Families, arranged in their sequence, in order that their characters may be clearly contrasted and the general principles which determine their arrangement showed—a new feature in the Manual, and a most useful one.

Periodical Literature.

In *Harper's Magazine* for January we may read of "The Smyrna Fig Harvest," which, though gathered from a very small district, supplies the world with almost all its dried figs. Classic memories fill the air as one travels by railroad from Smyrna, first to the village, which stands where Ephesus once stood, and then along the valley of the Meander where the bottom lands are covered with the Fig orchards. "The soil of this tract is very deep and has the property of retaining moisture so necessary for the crop. This peculiarity is of special importance, as in cases of drought the Fig-tree does not generally show at the time signs of drooping. The leaves retain their strength and color. It is only afterward, when the fruit should have reached maturity, that its stunted size and diminished yield show the effects of the check." The fig grown for drying is a short pulpy fruit, quite unlike the ordinary black eating fig, being bright yellow-green outside, and inside white with a red centre, and, in spite of its abundance of juice, having a poor and rather faint taste. Spring brings no especial beauty to the Fig orchard, as the tiny flowers are borne on the inside of a hollow fleshy receptacle, which later ripens into the fruit. "About the middle of August the figs begin to fall and then all the population of the neighboring villages is poured into the gardens . . . gathering up the fruit and piling it into the baskets. . . . At first the gleanings are over the whole garden. The figs lie as they fall, and the sun has ripened only the most forward of them. But by the end of August the heavy fruit drops so thickly that the pickers will fill a basket with what they gather up from under a single tree," each basket forming a heavy load for a woman. The picturesque appearance of the orchard at this season, with its groups of gaily dressed laborers, is well suggested in the illustrations given. The figs have but a short distance to fall, and "are generally picked up whole. If they lie on the ground for more than twenty-four hours they rapidly spoil. The next step is to dry them. A bank of earth is raised some six inches high and strewn with rushes, and here the figs are laid out in single layers, touching one another. The contact does not last long. The September sun is so hot that in a week the fruit is all shriveled up, and when the figs are but half their original size, the time has come for storing and packing them away in bags." The best are called "Eleme" figs, and these, whether of first, second or third quality, are

exported, while the fourth quality is used at home as food for cattle, and in the manufacture of a cheap spirit, the refuse serving as manure. It is curious to learn, however, that the seeds of this quality are employed in London in the making of what is called strawberry jam. All the fruit is sent to Smyrna and thence distributed, the fig market in a narrow street offering one of the most animated sights in the city, and large fleets of steamers often lying in the harbor awaiting their cargo of dried fruit. The fruit is sorted in large warehouses, exclusively by women, but the "pulling" and packing is done by men. In pulling, "the fig is drawn between finger and thumb, flattened and split at the stalk, so as to take the form which it preserves when it ultimately is found on the dinner-table. Through the middle and end of August, and through September, the work is carried on, though in the last weeks of this month the supply of figs falls off and only the best pullers and packers are kept. By the second week in October the fig harvest for the year is at an end." About a quarter of a million of pounds of dried figs are annually exported, in addition to the large quantity of inferior fruit that is used at home.

The writer mentions the practice of hanging wild figs on the cultivated trees when these are in bloom, but misses the significance of the operation. This use of the wild fig is a very old custom known technically as "caprification" and its object is to secure the fertilization of the cultivated fruit through the visits of certain hymenopterous insects (*Blastophaga* and *Sycophaga*) which frequent the wild Fig-tree. These insects being thus brought near the cultivated trees, enter the minute orifice of the receptacle of their flowers for the purpose of depositing their eggs, and in doing this convey the pollen of the rare male flowers to the stigmas of the females, which are usually much more numerous in the fig. All this is well known, but the curious part of the matter is how the custom, which has been practiced apparently from an early period, first originated. That its utility and even necessity is fully recognized now appears in the fact stated by our author, that in seasons when the crop of wild figs is light as much as four cents apiece are paid for the wild fruit, and that the profits of the cultivated crop are swallowed up by this outlay. What cunning oriental precursor of Sprengel and of Darwin penetrated the secrets of cross-fertilization?—for without some correct idea of the relation of the visiting insects to the ripening of the fruit, it hardly seems possible that a custom so troublesome and so expensive could have been developed.

The fact that the soil of the valley of the Meander has the property of retaining moisture for a long period makes it the great centre of the fig cultivation in the east, and it is only where similar conditions exist that the culture of the plant can be hopefully attempted. "Some years ago," writes our author, "Mr. West discovered in California a tract of soil which he believed to be almost identical. The climate also was similar. Mr. West took back with him some 300 roots. These Fig-trees have done well. They have made good growth and yielded fair crops, but a sufficient time has not elapsed for the tree to reach such maturity as should test the value of its fruit for preserving. It is only when the trees are from five to seven years old that they begin to bear fruit useful for commercial purposes; but once that age is attained, the tree will yield its annual crop for sixty or seventy, or, with careful pruning, for eighty years."

Orchids at Short Hills, New Jersey.

THE remarkable collection of Orchids in flower at the United States Nurseries is attracting large numbers of visitors this week. The *Cypripediums* alone present a spectacle that would repay the beholder for a long journey. Indeed, in a journey around the world, one could find no collection superior to this in richness, for it contains more than 400 species, varieties and hybrids. Of these, 212 are now in flower, including many of the rarest and most beautiful in cultivation. The only plant of *C. pavoninum* in the country is blooming here for the first time, and with it such choice hybrids as *C. Godseffianum*, *C. Savageanum*, *C. Sallierii* Hyeanum, *C. Fitcheanum*, *C. microchilum*, *C. calurum* Rougieri, *C. concinnum*, *C. Bergrinianum*, *C. Williamsi*, *C. regale* and *C. nitens superbum*, besides *C. villosum giganteum*, *C. apiculatum*, *C. Lawrenceanum pleioleucum*, *C. Mrs. Canham* and many more. Altogether there are 525 plants of *Cypripedium* in bloom, representing 212 varieties.

Of course this genus forms but a portion of the bewildering display of more than 1,000 Orchids which Messrs. Pitcher & Manda have in flower. There is a long list of varieties of *Catleya Trianae*, including the variety *Smithæ*, with dark sepals

and petals and orange-colored throat. *Cattleya Skinneri* also appears in many varieties, including several examples of the choice Alba and one of Arnoldiana. *Dendrobium Wardianum album* and *Lalia Arnoldiana* are shown in good specimens, and, in short, there are comparatively few of the really good Orchids now in flower which cannot be studied in this exhibition. C.

Notes.

The New York Forestry Association, at an adjourned meeting on Monday, was reorganized with Mr. Morris K. Jesup as President and Mr. J. B. Harrison as Corresponding Secretary. Additional particulars will be given next week.

The records of the Park Superintendent prove that the beauty of Central Park is fully appreciated by photographers at least. During the past year 1,700 permits to take photographs in the park were issued, and since January 1st nearly 300 have been bestowed or renewed, most of them to amateurs.

A letter from Para, Brazil, to the *Nation*, says that lumber forms the cargo of ships from New York to that country, a land possessing, scattered in lavish profusion over thousands of square miles of unbroken forests, sixty-seven varieties of the most valuable woods for structural purposes in the world.

The *Illustrirte Gartenzeitung*, of Vienna, recently republished the greater part of the accounts of *Pinus latifolia* in this journal (ii., 496) and *Staphylea Bolanderi* (ii., 544), saying that the tree "is probably quite unknown as yet in Europe," and that the shrub "has not yet been cultivated with us."

In the gardens of the Royal Botanical Society, of England, may be seen specimens of the common English Oak, which have been grown to fill ornamental beds. Planted forty or fifty years ago, they have been kept closely clipped, and are now only from ten to twelve inches in height, forming a dense mass of leaves.

A correspondent of the Philadelphia *Ledger* writes that active steps are now being taken to establish, at the University of Pennsylvania, a thoroughly equipped laboratory of plant-physiology and anatomy. Professor W. P. Wilson will go to Europe in the spring to visit the leading laboratories there, and will secure the best instruments and appliances and have them at the University ready for use next autumn.

Hermann Jaeger, whose death in the seventy-fifth year of his age was recently announced, was a noted German horticulturist, and had long held the position of Grand Ducal Garden Inspector at Eisenach. But he was still more widely known as perhaps the most popular writer in his country upon the practice and the history of gardening. He was a constant contributor to *Gartenflora* and other journals, and one of his books was the large illustrated work called "Gardening Art and Gardens in Past and Present Times," which was reviewed in our columns last year.

Gardeners as well as amateurs often ask why many plants in cultivation flourish best in soils and situations unlike those to which they had been accustomed in their native state. A writer in the *Gardeners' Chronicle* recently answered this question in a few words. In many cases, he said, plants grow wild not in those places which are best suited to them, but simply in those where competition permits them to exist, while in gardens their enemies are kept at bay by man, and the most favorable conditions for their development can be supplied.

The third volume of Dr. F. C. Schübeler's great work on the trees of Norway—"Viridarium Norvegicum"—has just been issued at Christiania. It is a large quarto of nearly 700 pages, and completes the work, in which not only the different species of trees native to the country are described and illustrated, but also a multitude of individuals remarkable for size, antiquity or abnormal development. A voluminous index now adds to the value of the book, and the polar limits of all the trees native to, or grown in, Norway are systematically given.

Florists' reports indicate a fairly good holiday trade in flowers this year, although at New Year's the sales were much smaller than those at Christmas, which was quite contrary to the rule for several years past. The prevailing epidemic undoubtedly affected the season's gaieties, and, in consequence, the demand for flowers. White flowers constantly grow in favor for decorative uses, now being often employed to the exclusion of all others. It is pleasant to find that, as was the case last year, all florists note an increase in orders for boxes of loose flowers, and a decrease of the desire for "set pieces."

A German journal, discussing the complaint of a French amateur that the Provence Rose, beloved of his ancestors, is sadly neglected to-day, states that 200 varieties of this Rose were once in cultivation, while hardly more than a dozen are familiar now. One of them was La Belle Villagoise, which was brought from Egypt in the time of the First Empire by the court surgeon, Antoine Dubois, a famous Rose grower. He gave it to the Tilly family in Halliée, where it may still be seen, while—so the statement goes—it cannot be seen elsewhere. It is described as having pure white petals streaked with a brilliant rosy red.

The Philadelphia Academy of Natural Sciences, assisted by the American Philosophical Society and a number of individuals, has arranged for an exploring expedition to the less known parts of southern Mexico and Yucatan. Specialists in botany and zoölogy will accompany the geologists, whose chief purpose will be to ascertain the general structure of the basin of the Gulf of Mexico, hitherto studied more thoroughly on the Florida side. As yet the archæologist has done more in the countries referred to than the scientific investigator. The expedition was to sail from New York for Progreso, Yucatan, on the 15th of this month.

In the Scilly Isles, where the cultivation of Narcissus flowers for market has become so large an industry, the rains and winds which rage there with extraordinary violence used to play havoc with the flowers, destroying thousands of spikes in a night. Close hedges were planted, but these did not avail against the searching winds. Of late years, however, the flower-spikes are carefully cut off and taken in-doors as soon as the buds begin to burst and just show the color of the perianth. Here they are slightly forced by being placed in shallow pans of warm water. The keeping qualities of the flowers are not injured by this process, while their perfection is secured and their opening is hastened a day or two.

The raising of Peppermint for the manufacture of oil is an important industry in Wayne County, New York. The plants are set out in May, in rows two feet apart, and grow to be about two feet high by August, when they are cut off close to the roots with a scythe and cured in the sun like hay for about twelve hours. The extracting of the oil is done by professed distillers, who are paid by a toll, or by farmers themselves in stills of their own. The still is a wooden vat about four feet high by six in diameter. In this the Mint is packed close by treading, covered with an air-tight lid, and subjected to the action of steam forced in from the bottom. The oil is volatilized by the steam and condensed in a worm, and the mixed oil and water, collected in a receiver, separate by specific gravity. It is said that there are a hundred public stills in the county, and it is locally believed that nine-tenths of all the oil of Peppermint used in the world comes from this region.

A number of prominent physicians of this city met last week for the purpose of protesting against the destruction of the Adirondack woods, because the extraordinary altitude of the plateau, from which still loftier mountains rise, its equable temperature and the hygienic properties of its coniferous trees combine to render it one of the most valuable health resorts in the world, and especially useful for the cure of consumption in its earlier stages. Dr. Trudeau, Chief of the sanitarium for the cure of consumption at Saranac Lake, reports that twenty-five per cent. of the incipient cases of consumption treated there are cured, and the health-giving properties of the region can be attested by thousands. An appeal to all public spirited citizens was drawn up requesting aid in the effort to enable the state to acquire such portions of the wilderness as had been sold, so that it can be held forever as public ground free to all the people of the state.

Dr. Moehl, of Cassel, writes to *Gartenflora* that the pyramidal variety of the European Oak (*Quercus pedunculata fastigiata*) was first seen during the Seven Years' War, in the Dieburg forest near Harreshausen, in Germany, and that its oldest offspring is the fine specimen which stands by the "bowling-green" in the park of Wilhelmshöhe, near Cassel. In the same park are flourishing young specimens of the fastigate Hornbeam (*Carpinus betulus*, var. *pyramidalis*) which have been propagated from a tree growing wild in the Reinshard forest, near Münden. This tree was discovered in the winter of 1871-1872 by a hunting party, and stands in a long plantation of Hornbeams which are only from twenty to twenty-five feet in height, while it overtops them, "like a slender Poplar," to a height of about forty feet. It is known that in the year 1820 an order was given to plant this place with natural seedlings of the Hornbeam, so the tree must be about seventy years old. It is said in the neighborhood that its peculiar habit did not show for many years after planting.

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The Waverly Oaks.

THERE is in Belmont, one of the suburbs of Boston, and formerly a part of the ancient town of Watertown, a group of Oaks which has come to be known in recent years as the Waverly Oaks, from the village near which they stand. These Waverly Oaks are, all things considered, the most interesting trees in eastern Massachusetts, and although there are larger Oaks in New England and in the Middle States, a group containing so many large trees is not often seen now anywhere in eastern America. There are in this group twenty-three large Oaks and one large Elm growing on an area of two or three acres. The Oaks are all White Oaks, with the exception of a single Swamp White Oak. They occupy mainly the slopes of a terminal moraine, along the base of which flows Beaver Brook, the "Sweet Beaver, child of forest still," sung by Lowell. The Waverly Oaks are well known to all Bostonians interested in nature, and strangers not infrequently make the pilgrimage to Belmont to look upon these venerable products of Massachusetts soil. It is strange, therefore, that so little has ever been printed about these trees. Emerson, the historian of the trees of Massachusetts, makes no reference to them. Piper, who wrote of the trees of America, and who lived not very far away, in Malden, seems to have overlooked them, and traveled all the way to Stowe to find his typical New England White Oak. Brown, another Massachusetts man who published books about trees, passed them by without a word. The poets and philosophers of Cambridge and Concord, who doubtless often passed by Beaver Brook, make no mention of its great trees, which first appear in print, apparently, in 1881, in *Harper's Magazine*, where Mr. F. H. Underwood, writing of James Russell Lowell, speaks of them on page 262 as "the only group of aboriginal trees standing on the Massachusetts coast"—a statement to which some exceptions might be taken. The Committee on Grounds of the Massachusetts Horticultural Society visited the Waverly Oaks on the 28th of June, 1884, and the chairman, Mr. J. G. Barker, joined to its report printed in the transactions of the

society for that year the other short account of the trees which has appeared coupled with a timely suggestion for their preservation.

This suggestion we desire to repeat and enforce; and that the public may know the beauty of these trees and of the spot where they grow, we reproduce on page 91 a view taken by Dr. W. H. Rollins, of Boston, showing a portion of the group.

The age which these trees have attained and the vicissitudes they have survived entitle them to respect, and the people of Massachusetts might wisely secure their preservation through the purchase and dedication to public use of the land on which they stand.

The age of these old Oaks can only be surmised. One famous naturalist is said to have declared that the smallest of them had existed through more than a thousand years. It is probable that this statement is greatly exaggerated. The largest tree in the group girths seventeen feet three inches at three and a half feet from the ground.* The principal tree in our illustration is smaller, with a girth of only thirteen feet four inches, measured at the same distance from the ground. An actual examination of the wood of this tree shows that it has increased three inches in diameter during the last twenty-four years. Had it made the same rate of growth during the whole period of its existence, it would have been 408 years old, and the largest tree in the group would be, with the same rate of increase, 508 years old. It is probable that they are both younger than these estimates make them. They may have grown less rapidly for several years at the beginning of their life, but there must have been a number of years, probably several hundred, when they increased more rapidly in diameter than they have during the last quarter of a century. The appearance of the trees justifies this supposition. They are still healthy, and are growing with considerable vigor; but there can be no doubt that their period of most rapid development has passed, or that, while they may continue, with proper care, to live and increase slowly for centuries perhaps, they will grow less rapidly now than they did one or two hundred years ago. But after making all due allowance for differences in the rate of growth at different periods in the existence of these trees, it is safe to surmise that the youngest of them had attained to some size before the Pilgrims landed on the shores of Massachusetts Bay, and that the oldest was at that time a tree of some size.

The ponderous lateral branches of these trees, reaching out in every direction, shows that they grew up in the open ground, which must have been cleared four or five hundred years ago, if, indeed, the dry and gravelly soil ever produced any other forest growth contemporaneously with these Oaks.

The Waverly Oaks grow within a few hundred yards of the station at Waverly, on the Boston & Fitchburg Railroad, on a piece of ground directly opposite the property of the trustees of the Massachusetts General Hospital, occupied by the country home of that institution. The whole region

* Messrs. L. L. Dame and Henry Brooks, of West Medford, who are engaged in preparing for publication an account of some of the most remarkable Elms and other trees of Massachusetts, obligingly send the following measurement of the largest of the Waverly Oaks, which stands on a steep slope: At five feet from the lower side, twenty-one feet six inches; at five feet from the upper side, sixteen feet six inches. There is a difference of several feet in the height of the ground at the upper and at the lower sides of this tree, and our measurement of seventeen feet three inches, taken at three feet and a half from the ground on the lower side, is perhaps as correct as any measurement can be made. Other measurements of Massachusetts White Oaks sent us by Messrs. Dame and Brooks are seventeen feet eight inches for the Oak at Bernardston; twenty-four feet five inches for the Oak at Boyleston; fifteen feet ten and a half inches for the Avery Oak at Dedham; fourteen feet one inch for the Elliott Oak at Natick; and thirteen feet seven inches for the Topsfield Oak. These measurements are all made at five feet from the ground. A White Oak recently cut on the estate of Peter C. Brooks, Esq., of West Medford, Massachusetts, measured at eight feet from the ground eight feet ten inches, and had approximately 200 layers of annual growth, as counted by Dame and Brooks.

Mr. John Robinson, in his account of the "Woody Plants of Essex County, Massachusetts," gives the following measurement of White Oaks: The Topsfield Oak, in 1875, had a circumference one foot from the ground of nineteen feet seven inches; the same trunk measured sixteen feet eleven inches at three feet from the ground, and twelve feet eleven inches at five feet from the ground. Two White Oaks on the Burleigh Farm, in Danvers, measured respectively nineteen feet and seventeen feet ten inches, both measurements being made at the ground, the first measuring thirteen feet six inches at six feet from the ground and the second twelve feet at five feet from the ground.

is undergoing rapid development, and houses are springing up on every side. The establishment of a small public park at this place, which need not exceed three or four acres in extent to accomplish this object, would protect the trees from the dangers which now threaten them, and would make a valuable and interesting public resort within walking or driving distance of the homes of a very large number of people.

Mr. J. G. Lemmon, the accomplished botanist of the California State Board of Forestry, discusses the problem of forest fires in the seventh bulletin issued by that board. "It is," he says, "a common observation that forests are usually bordered by a fringe of saplings and these by points and patches of seedlings all apparently flourishing finely and promising a material enlargement of the forest area; and scarce an instance is known where an edge of a forest is dying off by the natural course of events. The question arises, is this a normal attribute of forest-growth, or of forest-development? Did they always thus try to expand, or has some change occurred to them or their environment that now enables them to increase their periphery? The answer to the problem is contained in the two English words—Indian fires. The Indian desired open prairies and intervals for his game, that the latter might find better forage thereon, and also that he might the better mark them for his arrows. With the retirement of the Indian and the suspension of the annual forest and prairie-fires, the forests freely expand, and it is well known that young forests are covering large areas of the eastern United States, and it is believed that the great diluvian plains of the central west and of the Pacific slope might in time be covered with trees, if the practice of modern agriculturists did not serve to prevent their growth, desirable or otherwise. More than all the destructive processes of the lumbermen, and the close grazing of the flocks and herds of the stock raiser, is the ruin of the fire fiend; and against him the blazing forests, the menaced settlements and the ruined inhabitants of California appeal to citizens generally and legislatures especially for instant and adequate protection." It is by fires, as Mr. Lemmon points out, that "young seedlings are destroyed utterly, and usually the saplings are killed off, not consumed, while on a section of country from which the whole tree-growths have been removed after a fire, weeds and brambles will not come in until many years after. And how shall the crying evil of forest fires be stopped, where is the remedy, and who shall apply it?"

Mr. Lemmon is not the first thoughtful observer to ask these questions. The answer, perhaps, is wise legislation, but legislation will be useless unless it rests on public sentiment; and public sentiment in this country will not save the forests until the popular mind is more highly educated than it is to-day upon all subjects relating to the forests and their value to the nation.

The Coast of Maine.

FROM Cape Cod, Massachusetts, to Cape Sable, Nova Scotia, the broad entrance of the Gulf of Maine is two hundred miles wide, and it is one hundred miles from each of these capes to the corresponding ends of the coast of Maine at Kittery and Quoddy. Thus Maine squarely faces the wide opening between the capes, while to the east and west, beyond her limits, stretch two great offshoots of the gulf, the bays of Fundy and of Massachusetts. The latter and lesser bay presents a south shore built mostly of sands and gravels in beaches and bluffs, and a north shore of bold and enduring rocks, both already overgrown with seaside hotels and cottages. The Bay of Fundy, on the other hand, is little resorted to for pleasure. Its shores in many parts are grandly high and bold; but its waters are moved by such rushing tides, and its coasts are so frequently wrapt in cold fogs, that it will doubtless remain comparatively an unfrequented region.

Along the coast of Maine, stretched for two hundred miles from bay to bay, scenery and climate change from the Massachusetts to the Fundy type. At Boston the average temperature of July is 70°; at Eastport, at the farther end of Maine, it

is 61°. No such coolness is to be found along the thousand miles of monotonous sand beach which front the Atlantic south of the Gulf of Maine; and though the coolness of the waters of the gulf precludes most persons from sea bathing, this freshness of the air will always be an irresistible attraction to many thousands of dwellers in hot cities. Again, in contrast with the southern sea-beaches, the scenery of the Maine coast is exceedingly interesting and refreshing. The mere map of it is most attractive. Beginning at Piscataqua River, a deep estuary whose swift tides flow through an archipelago of rocks and small islands, the shore is at first made up of low ledges forming ragged points, connected by sand or pebble beaches, where farmers gather rock-weed after storms. Seaward lies a group of dangerous rocks, the Isles of Shoals. Beyond the tortuous outlet of York River and the Short and Long Sands of York, Cape Neddick and Bald Head lift high rocks toward the sea, and behind them rises Agamenticus Hill, a conspicuous blue landmark sometimes visible from Cape Ann, in Massachusetts. Low and sandy coasts succeed, fronting the old towns of Wells and Kennebunk. Cape Porpoise follows, a confused mass of rocky islets, salt marshes and tidal flats; then more long and short beaches, a lagoon called Biddeford Pool, the mouth of Saco River barred by its washings from the White Hills, more beaches, and so to Cape Elizabeth, a broad wedge of rock pushed out to sea as if to mark the entrance to the land-locked harbor of Portland.

Thus far the coast is sufficiently rich in varied scenery—in shores now high, now low, now wooded and now bare, now gentle and now rough; first thrust seaward in rocky capes, then swept inland in curving beaches, and now and again broken by the outlets of small rivers. Cape Elizabeth ends this scenery, and introduces the voyager to a type still more intricate, picturesque and distinctive. Casco Bay, with its many branches running inland and its peninsulas and islands stretching seaward, is the first of a succession of bays, "thoroughfares" and "reaches" which line the coast almost all the rest of the way to Quoddy. The ragged edge of the mainland becomes lost behind a maze of rock-bound islands, and appears but seldom where the surf can strike it. The salt water penetrates in deep and narrow channels into the very woods, ebbs and flows in hundreds of frequented and unfrequented harbors, and enters into countless hidden nooks and coves and narrows. Sand beaches become rare, and great and small "sea walls" of worn stones or pebbles take their place. Islands, islets, and ledges both dry and sunken, are strewn on every hand. The tides flow among them with increasing force, and the fog wraps them from sight more and more frequently as the Bay of Fundy is approached. Great cliffs are rare until Grand Manan is reached, and high hills come down to the sea only by Penobscot Bay and at Mount Desert; but, on the other hand, the variety of lesser topographic forms is very great. In Casco Bay, for instance, the rocks trend north-east and south-west, and all the crowded islands run out into reefs in these directions. Penobscot Bay presents wide stretches of open water divided by well massed islands, but still preserves a fine breadth of effect; and these islands differ greatly in form and character, according as they are built of hard and glaciated granite or of altered stratified rocks. The border bay of Passamaquoddy is distinguished by fine headlands, which terminate islands, generally lower than the heads. In like manner the sounds and fiord-like rivers differ much from each other. For instance, the Kennebec River is extremely narrow, and many bold knobs of rock turn it this way and that; but the neighboring Sheepscot is fully three miles broad at its mouth, and this noble width contracts but slowly; while the Penobscot above the Narrows takes on such a gentle appearance as to be hardly recognizable as a river of eastern Maine, the general aspect of this part of the coast being distinctly wild and untamable. Doubtless the raggedness of the rocky shore is the first cause of the almost forbidding aspect of the region, but the changed character of the sea-coast woods is a second cause. Beyond Cape Elizabeth, if capes and islands are wooded at all, it is with the dark, stiff cresting of Spruce, Fir or Pine, fringed perhaps with Birch and Mountain Ash. Near Kittery fine Elms and even Hickories may be seen on the open shore, but there is a gradual dying out of many familiar species as the coast is traversed eastward. Thus Holly and Inkberry, together with Prickly Ash, Flowering Dogwood and Sassafras, are not seen near the sea north of Massachusetts Bay. White Cedar, after following the coast all the way from the Gulf of Mexico, dies out near Kittery. York River is said to see the last Buttonwoods, Saco River the last Chestnuts, and the Kennebec the last Tupelos and Hickories. Conversely, this coast has its many forerunners of the flora of the far north. While

the White Pine is met with all along shore north of New Jersey, the Red Pine first appears by Massachusetts Bay and the Gray Pine by Mt. Desert. The Arbor-vitæ is first met with near the Kennebec. The Balsam Fir and the Black and White Spruces show themselves on no coasts south of Cape Ann, and do not abound until Cape Elizabeth is passed. It is the blackness of these dwarf coniferous woods which, with the desolation of the surf-beaten ledges and the frequent coming of the fog, impresses the traveler with the fact that this is a really wild and sub-arctic shore, where strange red-men's names for islands, capes and rivers—names such as Medomak, Muscongus, Pemaquid, Megunticook, Eggemoggin, Moosabec and Schoodic—seem altogether fitting.

The human story of the coast of Maine is almost as picturesque and varied as its scenery. This coast was first frequented by stray French fishing vessels, and first scientifically explored by Samuel de Champlain, whose narrative of his adventures is still delightful reading. Fruitless attempts at settlement followed, led by French knights at Saint Croix, by English cavaliers at Sagadahock and by French Jesuits at Mt. Desert; all of them years in advance of the English Colony of New Plymouth. Then followed a long period of fishing and fur trading, during which Maine belonged to neither New France nor New England, and a genuine border warfare was the result. Two rival Frenchmen also fought and besieged each other in truly feudal fashion at Penobscot and Saint John. Again, while the long French and Indian wars lasted, this coast saw more fighting. The older settlements west of Cape Elizabeth were sacked several times, and even the English stronghold at Pemaquid was captured; but the forest allies of the French Baron Saint Castin were beaten in the end. The numerous French names for points on the eastern coast bear witness to the long French occupation; as for instance, Grand and Petit Manan, Bois Bubert, Monts Déserts and Isle au Hault, and Burnt Coat, apparently English, but really a mis-translation of the French Côte Brûlée.

No Englishmen settled beyond Penobscot until after the capture of Quebec; and when they did, they, as Yankees, had to take part in still more fighting in the wars of the Revolution and of 1812. The settlers first fished and hunted, then cut hay on the salt marshes and timber in the great woods, and in later years took to ship building, and later still to stone quarrying and ice harvesting, and, near Rockland, to lime burning. These works are still the business of the coast. Even hunting is carried on at certain seasons in the eastern counties, where deer are still numerous. All the large Pine and Spruce of the shore woods have been cut; but Bangor still sends down Penobscot Bay a fleet of lumber schooners every time the wind blows from the north; and as for fishing, fleets of more than two hundred graceful vessels may often be seen in port together waiting the end of a storm.

It was about 1860 that what may be called the discovery of the picturesqueness and the summer-time healthfulness of the coast of Maine took place. Only the beaches of the western quarter of the shore were at first occupied by hotels; but when the poor hamlet of Bar Harbor leaped into fame through the resort to it of a few well known landscape painters, it became evident that the whole coast was destined to be a much frequented summer resort. At present, York, Kennebunkport, Biddeford Pool and Old Orchard Beach, together with the Casco Islands, Booth Bay, Camden, Mt. Desert and Campobello, are a few of the more populous neighborhoods; but summer hotels are now scattered all along the shore, and colonies of summer villas of all grades of costliness occupy many of the more accessible capes and islands. Thus there are many cottages at York, and the islands near Portland are fairly covered with cheap structures. Squirrel Island in Booth Bay is another nest of small houses, and Bar Harbor is a summer city surrounded by a multitude of very costly and elaborate wooden palaces. The finest parts of the coast are already controlled by land companies and speculators, while the natives' minds are inflamed by the high prices which the once worthless shore lands are now supposed to command.

The spectacle of thousands upon thousands of people able to spend annually several weeks or months of summer in healthful life by the sea-shore is very American and very pleasant, and the impartial observer can find but two points about it which are in any considerable degree discouraging or dangerous. The lamentable feature of the situation is the small amount of thought and attention given to considerations of appropriateness and beauty by the builders and inhabitants of the summer colonies of the coast. Indifference in these matters works ill results everywhere, but nowhere is lack of taste quite so conspicuous as on the sea-shore. Both corporations and individuals are guilty on this head. More than one

booming land company has hastily divided and sold its rough ledges in rectangular lots, whose lines bear no relation to the forms of the ground, so that houses cannot be well placed. The squalid aspect of the public parts of these settlements, the shabby plank walks and the unkempt roadways, are other causes of reproach. The houses themselves, if cheap, are too often vulgarly ornamented, and if costly, are generally absurdly pretentious. Even the government, which has lately been rebuilding many of the light-house keepers' dwellings, has substituted for the simple, low and entirely fitting structures of a former generation, a thin-walled and small-chimneyed type of house, such as is common in the suburbs of our cities. One of these perched on a sea cliff is an abomination, and might well have illustrated the mournful remark of a recent writer in the *Atlantic Monthly*, who pointed out that American indifference to beauty cannot be caused by the newness of our civilization, for when this was still newer we built both more appropriately and picturesquely than we commonly do now. Again, in the treatment of the ground about their houses, the millionaires of Bar Harbor are quite as apt to err as are the humbler cottagers of Squirrel Island. Smooth lawns, made of imported soil, and kept green only by continual watering, furnish a means of displaying wealth, but they cannot be fittingly united with scenery which is characterized by rough ledges and scrubby woods. On this rough coast level grass will please when it is joined to a house and enclosed by walls. In the open ground it can hardly ever be in keeping. Similarly incongruous are flower-beds scattered over rocky and uneven ground, set between the trunks of Pitch Pines, or perched on the tops of whaleback ledges; and yet such things are common sights at Bar Harbor.

The real danger of the present situation is that this annual flood of humanity, with its permanent structures for shelter, may so completely overflow and occupy the limited stretch of coast which it invades, as to rob it of that flavor of wildness and remoteness which hitherto has hung about it, and which in great measure constitutes its refreshing charm. A surf-beaten headland may be crowned by a lighthouse tower without losing its dignity and impressiveness, but it cannot be dotted with frail cottages without suffering a woeful fall. A lonely fiord shut in by dark woods, where the fog lingers in wreaths, as it comes and goes, loses its charm whenever even one bank is stripped naked, and streets of buildings are substituted for the Spruces and Pines. A few rich men, realizing this danger, have surrounded themselves with considerable tracts of land solely with the intention of preserving the natural aspect; and at least one hotel company, by buying almost the whole of the wild island of Campobello, has saved for the patrons of its houses a large region of unspoiled scenery. The readers of GARDEN AND FOREST stand in need of no argument to prove the importance to human happiness of that refreshing antidote to city life which fine natural scenery supplies, nor is it necessary to remind them that love of beauty and of art must surely die if it be cut at its roots by destroying or vulgarizing the beauty of nature. "Men cannot love art well until they love what she mirrors better," says Mr. Ruskin.

The United States have but this one short stretch of Atlantic sea-coast where a pleasant summer climate and real picturesqueness of scenery are to be found together. Can nothing be done to preserve for the use and enjoyment of the great unorganized body of the common people some fine parts, at least, of this sea-side wilderness of Maine? It would seem as if the mere self-interest of hotel proprietors and land-owners would have accomplished much more in this direction than it yet has. If, for instance, East Point near York, or Dice's Head at Castine, or Great Head near Bar Harbor, should be fenced off as private property, all the other property-owners of the neighborhood would have to subtract something from the value of their estates. And, conversely, if these or other like points of vantage, or any of the ancient border forts, were preserved to public uses by local associations or by the commonwealth, every estate and every form of property in the neighborhood would gain in value. Public-spirited men would doubtless give to such associations rights of way, and even lands occasionally, and the raising of money for the purchase of favorite points might not prove to be so difficult as at first it seems. The present year should see, all up and down the shore, the beginning of a movement in the direction here indicated. In many parts of the coast it is full time decisive action was taken, and if the State of Maine should by suitable legislation encourage the formation of associations for the purpose of preserving chosen parts of her coast scenery, she would not only do herself honor, but would secure for the future an important element in her material prosperity.

Boston.

Charles Eliot.

Entomological.

An Enemy to the Egyptian Lotus.

IN GARDEN AND FOREST for April 10th, 1889, was an interesting account of the naturalization of the Oriental Nelumbium in New Jersey, by Mr. E. D. Sturtevant, who has done more than any other man to popularize the cultivation of this plant. Beauty and poetry, combined, are represented by the flower and its traditions, but neither will serve to protect it against the sordid prose of insect attack. An enemy has appeared that annually ruins many of the plants, eating their leaves, buds, seeds, and even into the stem. The caterpillar—for it is a caterpillar—is a typical borer, living primarily in the leaf and flower stems; but as soon as buds form, they are attacked; the larva bores into the side and feeds so judiciously that the bud continues to grow, and will even open in due time, only to fall apart and to show a mass of black frass in place of a beautiful flower. The seed-pods also are attractive to the larvæ, and the seeds are eaten before they attain maturity. Unfortunately the insects seem to be increasing in number, and bid fair to render Lotus-growing unsatisfactory. To Mr. J. Turner Brakeley, of Bordentown, I owe my introduction to the larvæ infesting these plants, the specimens sent me being from Mr. Sturtevant's ponds. According to the statements made, the larva, when it first appears, lives on the outside of the leaves in a little silken tent, but very soon gets under cover somewhere, either in bud, stem or seed-capsule, whichever is most handy. It continues its work during the summer, and in fact until frost puts a period to the life of the leaves. It was in the latter part of July when specimens of infested stems, buds and seed-capsules reached me, and there were sometimes three to four larvæ in a single stem. In general color the caterpillars are a dirty white, with a more or less evident reddish tint, and rather stout of build, the head and dorsal plate smooth, yellowish, mottled with red-brown. Each body segment has two larger dorsal yellowish tubercles, one large tubercle each side, and usually two smaller, also yellowish, tubercles near the posterior end of the segment. The annexed figure will give a fair idea of the general form, and the mouth parts or instruments of destruction are also shown in detail. When full grown the larva is nearly an inch in length, and then spins a rather flattened cocoon of a quite dense texture inside the stem and changes to a blackish brown pupa about half an inch in length. Towards the middle and latter part of August the moths issued, and proved to be a species of *Botis* not previously described. From its food plant I name it *Botis nelumbialis*.

In general color it varies from a pale clay yellow to a powdery, rusty red, all intervening shades being represented. Two dentate dark lines cross the wing, one near the base, the other toward the outer margin of the wing. Usually there is a dusky discal spot and a dark shade close to the outer margin, but sometimes only the median lines are visible. The

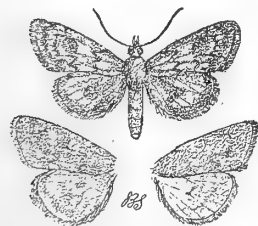


Fig. 19.—*Botis nelumbialis*, Smith; varieties.

figure shows three forms of the new species, about natural size. These insects promise to become quite a serious pest, and it is not easy to suggest a certain remedy. Black-birds are said to eat the larvæ, while they are exposed. Where there are but a few of the plants, they can be easily kept clean by picking them off before they take to shelter. It is probable that in their method of passing the winter we shall have an opportunity to control them. If, as I suspect, the winter

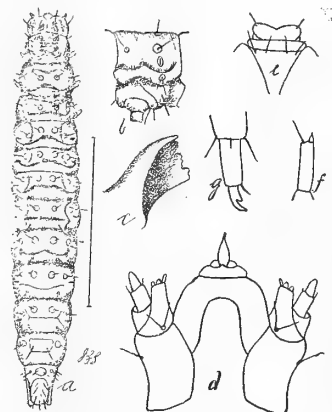


Fig. 18.—*Botis nelumbialis*, Smith; a, larva from above; b, a single segment from side, showing sculpture; c, mandible of larva; d, maxillæ and palpi; e, clypeus; f, antenna; g, leg. All greatly enlarged.

the water line, the cut material to be buried deeply enough to prevent all chance of the larvæ working their way out.

Rutgers College, February 8th, 1890.

John B. Smith.

New or Little Known Plants.

Gladiolus Turicensis.

WE are indebted to Messrs. Froebel & Co., of Zurich, for the drawing from which has been made the illustration, on page 89, of *Gladiolus Turicensis*, concerning which they send the following note:

"Mr. Max Leichtlin, of Baden-Baden, was the first to improve garden Gladioli by an infusion of the blood of *G. Saundersii*. The first variety obtained in this way he named *G. Saundersii superbis*. In 1880 we produced two varieties by crossing *G. purpureo-auratus* with *G. Gandavensis*, which we named *G. Froebeli* and *G. Engesseri*. These were both good varieties, and proved perfectly hardy. *G. Brineri*, of the same parentage, followed in 1885. *G. Turicensis* is our last production, obtained by a cross between a large-flowered variety of *G. Gandavensis* with *G. Saundersii superbis*. The flowers of *G. Turicensis* are a fine purplish crimson color, the lower segments of the perianth beautifully marked with white. When fully expanded the flowers are upward of three inches across. The flowers of *G. Saundersii* have the bad habit of bending in toward the stem, while those of this hybrid, when fully expanded, look one in the face, so to speak. *G. Turicensis* is a plant of exceedingly vigorous growth, the spikes of flowers attaining the length of two feet. It is a free bloomer, and seems well adapted to plant in beds where masses of flowers of one color are needed."

Should this plant prove, as it is predicted, perfectly hardy, it will make, certainly, one of the most valuable additions to the list of hardy summer-blooming bulbs which has appeared for some time. Whether it is hardy or not, however, it is a plant of great value, which will be watched with interest by all growers of Gladioli, not only for the beauty of its flowers, but as an element of possible future improvement in garden varieties of Gladiolus.

Foreign Correspondence.

Berlin Letter.

HYACINTHS bloomed much earlier than usual this year, such varieties as Homer, Maria Cornelia, Wilhelm I. and Norma being in flower from ten days to two weeks before their usual season. The same remark is true of the Tulips, and it is interesting to know that the bulbs grown here are forced more easily and flower earlier than Holland bulbs, a fact which has been known to Berlin gardeners for some years past. The culture of spring bulbs, which was once a prominent industry here, has fallen off within the last ten years, but the tide has again turned, and large fields of Hyacinths, Tulips and Scillas can now be seen, a result largely due to the energy and enterprise of Mr. Spath. Old gardeners say that the bulbs have not flowered so early as they have this year since 1840. They attribute this fact to the very hot and dry May of last year, which in their opinion ripened up the bulbs quickly and perfectly. I am not sure, however, that this is the true cause. It is well known that plants which suffer so much from dryness, or any other cause, that they are in danger of death, at once begin to develop flower-buds. It is as if the instinct of the plant for the preservation of its species asserts itself whenever the individual plant is threatened with extinction. Every gardener knows that plants which are to produce abundant foliage should be well fertilized, while plants which are needed for bloom should be kept in more or less sterile soil. In consideration of this it is my opinion that the early flowering of these bulbs is really due to the hot and dry May, although not to the fact that the bulbs were ripened well, but rather because in their enfeebled condition they followed the general law and gave all their energies to the production of bulbs.

This opinion is based on practical experience. To decide this and many other questions with accuracy would require the work of horticultural experiment stations, but these are entirely lacking in Germany. We have fine horticultural schools where gardeners may learn all that is necessary for them to know, in practice, of plant life, but a station in which experiments can be made on the same broad scale as they are made in the agricultural stations has not yet been established in Germany. How strong the interest here is in the education of young gardeners appears from the fact that the Royal

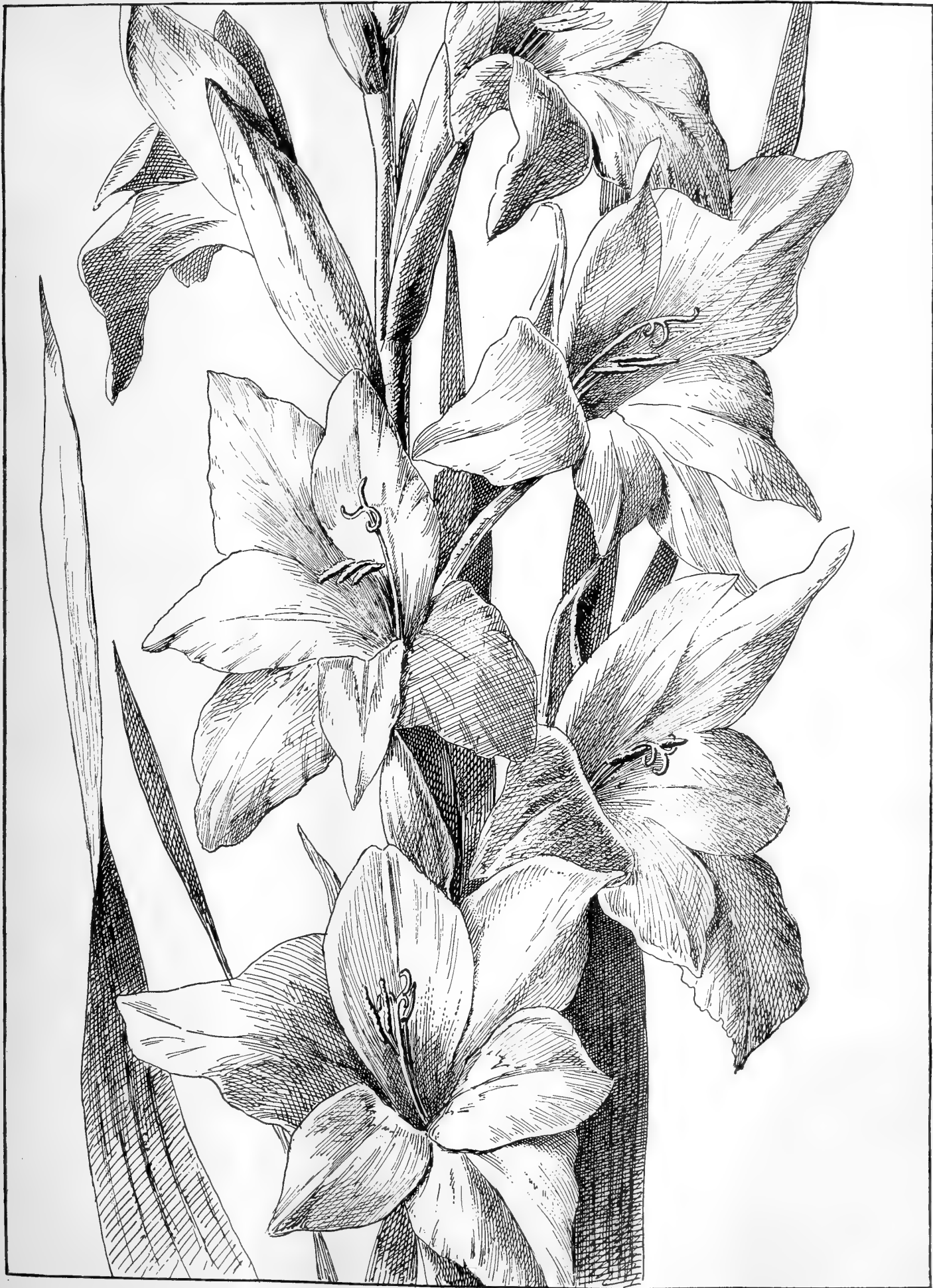


Fig. 20.—*Gladiolus Turicensis*.—See page 88.

Land Culture Commission, in November last year, recommended a grant for a horticultural school, as well as the establishment of a branch for horticultural art in one of the high schools of Dresden. The establishment of a horticultural academy similar to the agricultural academies is merely a question of time, but more necessary now than all this seems the establishment of a horticultural experiment station. The questions to be solved are so numerous that opportunities for usefulness would at once present themselves.

An event of the first importance will be the great International Horticultural Exhibition which is to be held in Berlin from the 25th of April to the 5th of May. Hitherto such exhibitions have been great plant-shows where the public could see the progress of horticulture in well grown specimens. Now and then there was a space for garden-plans, or a carpet-bed attracted attention. Sometimes, also, arrangements of cut flowers were to be seen; but this exhibition will have some entirely different features. Exhibitors will have opportunity to show the public how plants can be used for decoration on different occasions. Two large banquet halls—each one sixty-two and a half feet wide by eighty feet long—will be provided, and these, with the tables, are to be decorated in competition. Then there will be a chapel to show decorations for nuptial ceremonies, baptisms, etc., and besides these, ten rooms, each twenty-three feet long and twenty feet eight inches wide, to be considered as parlors, dining-rooms, etc. This will give opportunity to show how different rooms can best be decorated for different occasions. There will be two yards connected with houses, one furnished with porticoes and the other with balconies, both of which are subjects for competitive decoration, not to mention windows, pergolas, pavilions and the like. The entire exhibition palace will be 625 feet in length and 295 feet in breadth, with a hall for meetings, one for exhibitions, and one for landscape-gardening and horticultural literature.

Other space will be divided as follows: For the decorative display, 4,200 square feet; for stove and greenhouse plants, 14,000 square feet; for Roses, forced flowering shrubs, perennial plants and bulbs, each 3,150 square feet; for nursery products, 7,200 square feet; for cut flowers, grasses, etc., 2,650 square feet; for vegetables and fruits, 650 square feet.

Besides these there will be hot-houses, greenhouses, etc., usually in full operation, so that Orchids and other stove plants will find comfortable quarters in a hot-house constructed within the exhibition limits. The houses are all to be entered in competition, as will be the boilers and other methods of heating. A large hall in connection with the exhibition palace will be devoted to garden implements and machinery.

This exhibition, international as it is, will show phases of gardening quite different from those seen in the older ones. The number of medals and prizes is enormous. The Emperor himself has offered a large gold medal as the highest prize. It would add greatly to the attractiveness and value of the show if American gardeners would offer examples of their art, so that their styles of decoration could be compared with those which prevail here. That foreigners can compete here with success was proved at the last Chrysanthemum show in November, when two English gardeners received the first prize, the gold medal. Large collections are already in preparation in the Riviera for this exhibition. One nurseryman alone is preparing to send four railway cars full of Palms, Crotons and the like.

Palm culture in the open air is making some headway in Germany. In the Berlin botanical gardens this winter, which so far has been very mild, an experiment has been made with *Chamærops excelsa*. In Altenburg, Thuringia, a Mr. Köhler has succeeded, it is said, in growing *Phoenix*, *Pritchardia*, *Chamærops*, *Cocos Weddelliana* and *Cycas revoluta* out-of-doors.

In the flower shops now *Azalea Indica* is the prevailing plant. Besides these, forced Roses of remarkable merit abound, and though the prices are very high there is a great demand for them.

Udo Dammer.

Berlin.

Cultural Department.

Fern Notes.

THE remarks of Mr. Watson in his London Letter of a few weeks since to the effect that popular interest in Fern collections in England seems to have fallen to a low ebb of late years, reminds us that a very similar state of affairs prevails on this side of the ocean, for while attention is frequently called to the rapid increase in numbers and varieties contained in the various collections of Orchids in the United States, in both private and commercial establishments, yet the Fern collections in the same wide territory, that are worthy of special

mention, may perhaps be counted on the fingers of one hand. Now this is not intended to imply that the Orchids are not worthy of all the publicity that has been given them, but merely as a statement of fact, and though fine Ferns are seen at some of the exhibitions, yet it must be conceded that they are somewhat scattered.

While there is no doubt that the use of small Ferns in floral arrangements has very largely increased during a few years past, and that in consequence they have been grown by thousands in a number of commercial places, yet the species and varieties so grown are very few, being limited to some of those easily-propagated and rapid-growing sorts that require but little special attention. In fact, a list of a dozen to fifteen names would comprise those most used in this way, and might read as follows: *Adiantum cuneatum*, *A. pubescens*, *A. gracillimum*, and in smaller quantities *A. Farleyense*, *Pteris serrulata* and *P. serrulata cristata*, *P. Cretica* and its varieties, *P. argyræa*, *P. tremula*, *Onychium Japonicum*, *Davallia tenuifolia stricta*, *Asplenium Belangeri*, *Doryopteris palmata* and *Nephrodium Sieboldii*. Occasionally a batch of *Lygodium Japonicum* is seen grown on the same plan as *Myrsiphyllum asparagoides* (that is, on strings for wreathing), but this is usually in limited quantities.

It would, however, be quite an easy task for any Fern-lover to compile quite a long catalogue of distinct species that may readily be grown in cool-house temperature (about forty-five degrees at night) and in a house so located as not to be entirely satisfactory for the cultivation of flowering plants. In such a house may be grown a number of different types, from moderately developed tree-ferns down to such charming miniature ferns as *Davallia parvula* and *D. alpina*.

Among the larger growing species specially adapted to cool-house culture may be mentioned some of the *Alsophilas*, as *A. australis*, *A. excelsa* and *A. Capensis*, all of these being noble species and of vigorous growth. *Dicksonia antarctica* is an indispensable sort for this purpose, being highly ornamental either in a small plant, or when it has attained its full development and presents a massive trunk twenty feet or more in height and possibly one foot in diameter. *Dicksonia squarrosa* and *D. Youngia* are also admirable species and somewhat smaller-growing than the foregoing. *Dicksonia Barometz* is another valuable fern of strong growth, though not arborescent in habit. This plant throws up its dark green bipinnate fronds to a height of five to six feet, the fronds being freely produced from a very hairy decumbent rhizome.

In this genus is also to be found one of the handsomest large Ferns in cultivation; *Dicksonia Schiedeii*, with long pendulous fronds which sometimes attain a length of twelve to fifteen feet. The fronds are bipinnate, light green in color and glaucous on the under side, and the stipes and crown of the plant being densely covered with silky hairs adds much to its attractiveness. *Brainea insignis*, the only member of its genus and a native of China, is also a valuable addition to any cool-house collection. It is of moderate growth, the fronds averaging from two to three feet in length, and is said to develop a trunk four or five feet high, though there are probably but few of that size in cultivation, its growth of trunk being very slow. *Woodwardia radicans* and *W. orientalis* are very easily-grown cool-house species, the former being especially graceful in habit, its long pendulous fronds hanging down like a delicate green drapery, and in a good specimen frequently attain a length of six to eight feet. Another interesting point in connection with this Fern is the proliferous habit of its fronds, the young plants being produced in quantity on the upper surface of the frond. A number of the *Pteris* and *Aspleniums* are also suited to this purpose, prominent among the former being *Pteris scaberula*, an excellent Fern either as a specimen or for cutting, though it has one drawback in being partly deciduous in the winter.

The well known *Pteris argyræa* and *P. serrulata* in its many forms are too widely distributed to need further recommendation at this time. It may be added that the large-growing Ferns to which attention has been invited will also be found of great utility as out-door ornaments in summer, providing they are placed in a somewhat sheltered and shaded position and well supplied with water.

Holmesburg, Pa.

W. H. Taplin.

Protection Against the Striped Cucumber Beetle.

THE striped Cucumber Beetle (*Diabrotica vittata*, Fabr.), is a most malignant enemy to battle where it has once gained possession of the field. The oft-printed formulas that abound in our horticultural journals generally prove signal failures when put to the test in anything like a severe attack. At best, applications to the foliage are expensive and more or



The Waverly Oaks.—See page 85.

less detrimental to the plants. Gardeners and entomologists are at last pretty well agreed that some protection placed over the hill before the plants appear above ground will prove most satisfactory in the long run. The fact that such protection often aids materially in preventing injury from frost is an important point in its favor, as the *Cucurbitaceæ* are among our tenderest open-air plants.

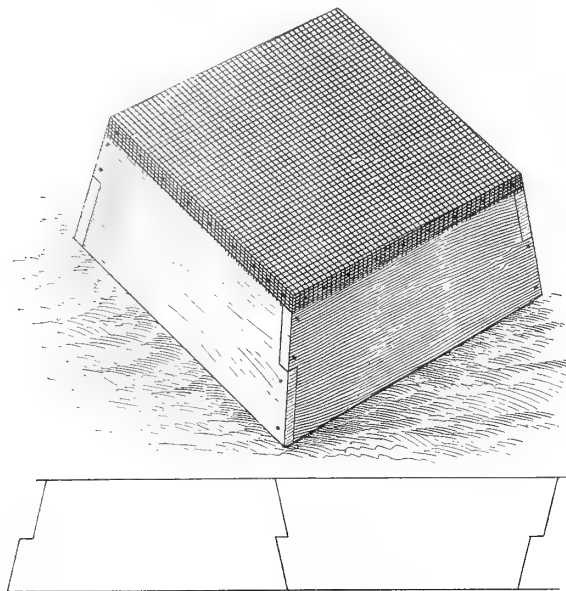


Fig. 21.—A Simple Plant Protector.

The protector illustrated in the accompanying sketch has the merit of being strong, light, durable and economical of storage, as well as being entirely efficient and cheap. The difficulty with most of the plant-protectors in use is that they are too fragile, too costly or too bulky for convenient storage. The one here shown is made of five-eighths-inch undressed pine lumber, covered over the top with ordinary wire mosquito netting. The frame may be made sixteen inches square at the top, and the sections are cut so that the bottom is slightly larger, giving flare enough to admit of nesting the boxes together for convenient storage. By cutting the boards in the manner shown in the drawing, they may be "double-nailed," which greatly adds to the strength of the frame without increasing the weight or cost.

University of Wisconsin, Madison.

E. S. Goff.

Orchid Notes.

Arides Roebelenii is now flowering here. It is one of the later additions to this extensive genus, but is no great acquisition. It much resembles *A. quinquevulnerum* in its erect, sturdy habit and dark green, glossy leaves. The ascending racemes are about one foot long, bearing about thirty flowers, small and greenish white, with a fringed incurved lip tinged with rose at the apex. There is little to recommend this species except its free blooming quality and the pleasant fragrance of the flowers. It was introduced some five years since from the Philippines, and grows freely in the warmest house.

Odontoglossum Rossii was imported in such vast quantities a few years ago and sold so cheaply that it became the best known of the genus; but, to keep it in good condition for any great length of time, it should be given the treatment recommended for *Lælia anceps* and other Mexican Orchids. It quickly deteriorates in the damp, sunless houses usually occupied by this genus. It is an extremely free blooming kind, and a well grown plant is literally covered with flowers, which remain a long time in perfection in a cool, dry atmosphere. It is admirably adapted for cutting, and if a number of plants are grown and care is used in forcing or retarding the flower-buds, they may be had in bloom more than half the year. *O. Rossii* has a very wide distribution in Mexico, and in some localities it grows in immense quantities. There are also a great many varieties, consequent on the great variation of climate; and in some few cases on supposed cross-fertilization with allied species. Since the variety Majus was introduced the typical form appears to be lost, for one seldom hears of plain *O. Rossii*.

Odontoglossum elegans, a very rare and beautiful plant, is flowering freely with us. It is supposed to be a natural

hybrid between *O. cirrhosum* and *O. cristatum* or *O. Hallii*. The habit and inflorescence much resemble those of *O. cirrhosum*, but the flowers are larger and have broader segments. The color is pale yellow, with heavy blotches and bars of reddish brown, and a purplish crimson blotch near the base of the petals. The narrow lip is reddish brown at the base, with the front portion white; the crest is yellow, and the column white. The plant was introduced from Ecuador about ten years since, and but few are now in cultivation. It grows freely at the warmest end of the cool-house, but requires a good season of rest and must not be overpotted.

Kenwood, N. Y.

F. Goldring.

Vanda Amesiana is one of the most pleasing of the Orchids now in flower. I lately saw a large number of plants, each bearing several spikes of bloom, in the houses of Messrs. Low & Co., of Clapton. The flowers are so delicate and pretty, and, moreover, are so deliciously fragrant, whilst the plant itself has such a healthy, business-like appearance, that this species cannot fail to become one of the most useful and popular of tropical Orchids.

Kew.

W.

Brussels Sprouts.

THE seeds of this excellent form of Cabbage should be planted in the house, hot-bed or greenhouse as early as the first of April, as it requires a long season to perfect its growth. The young plants resemble those of the Cauliflower, and will be large enough to set in the open ground as soon as the weather and soil favor a free growth; till then they should be kept in flats of earth, not crowded, and they may need more than two transplantings. If so, each change will have a tendency to develop roots, and if the plants have also been exposed to the free air and sunlight, they will be strong and healthy. A soil to grow Brussels Sprouts should be strong, and also well enriched. The early part of the season's growth is required to develop stature and leaves to the plant; later in the season, the leaves, beginning with those first formed, and near the ground, fall off, and from their axils buds or small heads of Cabbage develop spirally around the stem, and quite as thickly as they can cluster. This process continues till fall. At maturity the plants having the most perfect collection of buds are saved for wintering. Some never have heads large enough to use, and some will bloom like a green Rose; these are failures. Take up the selected plants before the hard frosts, with abundance of earth; bring them into a cool cellar, either light or dark; set the roots not too close together in the ground, give them water once, and the season can be prolonged till the spring months. The green worm is as troublesome as it is to other members of the Cabbage-family, but the plants are quite hardy, and repay the endeavor to grow them.

They are prepared for the table by first separating them from the stalk and removing the imperfect leaves. After lying in salt and water for half an hour, they are boiled for twenty minutes in water to which a little soda has been added, and are served with either cream, butter, or vinegar sauce. They have a very pleasant cabbage-flavor, peculiar to themselves.

West Springfield, Mass.

W. H. Bull.

Doronicum Harper Crewe.—This is a most interesting plant, belonging to the *Compositæ*, with flowers of the very brightest yellow, somewhat larger than a silver dollar, with about forty-four very narrow florets. As a winter-blooming plant in a cool greenhouse it is most effective, the flowers remaining wide open all night. The leaves are heart-shaped, of a very dark green, and growing close to the soil. I have plants in six-inch pots which have been in flower for two months, and at no time have there been fewer than three flowers at once. It delights in a sunny position and a temperature of forty-five to fifty degrees at night. This plant can be recommended as a very good subject for amateur culture.

Seed-Sowing.—The many failures experienced in the germination of very small seeds, such as those of Begonia, Gloxinia and Calceolaria, is the result of too deep covering in nine cases out of ten. My plan of treating all small seed is this: I use light sandy loam, which is heated to a temperature of 120 degrees; one-half is then passed through a sieve having meshes half an inch in diameter. This is then spread to the depth of an inch in boxes. The other half of the soil is passed through a sieve having meshes a quarter of an inch in diameter, and a portion of this is spread over the first soil, made very smooth by being slightly pressed with a board having a planed surface. The seed is then evenly sprinkled over it, and in the case of very

fine seed it is not covered at all with soil. The whole is then carefully watered with a fine rubber sprinkler. Seeds such as Aster, Stocks and Primroses are covered with soil to the depth of about the thickness of the seeds. The finest seeds are covered with sheets of glass, on which is kept a single covering of paper, either an old newspaper or light packing paper. The coarser seeds are covered only with paper, and at no time until germination takes place is any direct light admitted. After germination the paper is removed at night, and again replaced for a while during the day-time. A safe temperature for most seeds is from fifty-eight to sixty-five degrees.

Pearl River, N. Y.

John Thorpe.

Lachenalia Nelsoni.—The admirers of hardy plants owe a debt of gratitude to the late Rev. J. Nelson for the valuable garden varieties of the common Moss Pink (*Phlox subulata*), which were originated by his skill, and have proved so valuable in the spring garden. Many other admirable hybrids were produced by this enthusiastic amateur, and among them the one named at the head of this paragraph. Of all the *Lachenalias* we have tried this is best adapted to general use. The flowers are bright coral-red in bud, and golden yellow when expanded; they are borne on stems six to eight inches long just above the foliage, which is prettily mottled with brown. The value of *Lachenalias* as winter-blooming plants lies in the durability of their flowers, which last in good condition for nearly two months. Nothing is more simple than the culture of these bulbs. They should be potted in September, three in a four-inch pot, and in winter kept in a light place, where the temperature does not fall lower than forty-five degrees; they will then flower in January and February. After flowering the foliage soon dies down, when the bulbs require no water until potted again in September. There is no reason why these plants should not become popular for window-culture, as the conditions necessary to the successful flowering of a *Geranium* in winter suits *Lachenalia Nelsoni* admirably, both, in fact, being the offspring of plants native to South Africa.

Passaic, N. J.

E. O. Orpet.

Christmas Roses.—My experience with this species of *Helleborus* and its varieties agrees with that of Mr. Gerard. This winter and the preceding one cannot be accepted as a test of their hardiness. Even protected by the ordinary hot-bed frames and sashes, I am far from believing that they would flower during a winter as severe as that of 1884-85. To induce them to flower in such a winter the frame would need the further protection of a lining of litter besides mats and shutters. Cultivated under such conditions, they lose their claim to be considered hardy, and above all, their charm. The majority of people who cultivate hardy plants can enjoy them only as such, and they should not remain under any delusion about Christmas Roses.

Wellesley, Mass.

T. D. H.

The Forest.

The Need of a Forest Policy in Pennsylvania.

THE need of a more rational system of forest management is as great in Pennsylvania as in any of her sister states. That this has been a settled conviction on the part of many thinking men is apparent from the frequency with which forestry matters have been discussed before her agricultural and other societies. In 1881 the State Board of Agriculture appointed a committee on forestry, which, in the succeeding year, rendered a carefully prepared report, which was the result of inquiry in every part of the state, and gave answers to the questions as to (1) the approximate amount of old timber in each county, (2) the amount of young growth, (3) the best protection against fires, (4) the legislation which seemed desirable, together with some others of less moment.

These inquiries developed a widespread feeling that, although Pennsylvania had been one of the best timbered states of the Union, there was now need of a husbanding of the remaining forest resources, and some encouragement to reforestation and protection from fires. How to secure these ends gave rise to various suggestions more or less practicable, which, from time to time, were brought to the attention of the Legislature. But they appeared—at least to the Legislature—to lack distinctness and purpose, or to be impracticable, and nothing came from them. In 1888 the Governor of the Commonwealth, acting under a joint resolution of the Legislature, appointed a committee of five citizens to consider and report upon the forests of the state, and to recommend legislation if they saw fit. No provision was made for the expenses of such committee, and it was left to determine its own methods and

scope of work. None of the committee felt that, under the circumstances, any considerable personal examination of the forest-condition and needs of the state could be made; hence they sought to obtain all the information possible through correspondence. And by personal letters chiefly, and a circular to county officers and corporations, collected a large number of facts as the basis for their report.

The report which they rendered was a brief and compact résumé of the general forestry question as it exists in the eastern United States to-day, fortified by various facts and considerations which had special bearing on the condition in Pennsylvania. That a more elaborate report was not presented was, perhaps, a disappointment to some, but it was felt that, in the absence of authentic and definite information, a longer report, founded, as it must have been, on general principles alone, would carry no additional weight, and might even be of lessened value. Accompanying the report was the draft of a bill, which it was hoped might commend itself to the Legislature. The main features which it embodied were as follows:

The appointment of a permanent forestry commission of three members, with power to elect a secretary, who is the working member of the board; also such wardens and agents as they may deem necessary, and to define their duties. The duties of the commissioners were to ascertain the true state and condition of the forests of the commonwealth; their relation to the needs and industries of the people; the rate of destruction by different means, and the prosecution of offenders of the laws relating to forests. The means necessary to accomplish these purposes were detailed as fully as seemed practicable.

Circulars or bulletins of information on forestry methods were to be issued for the benefit of landholders. The subject of forestry was to be brought before the teachers of public and normal schools and various associations by a lecturer to be provided by the board, and by the distribution of *Forest Leaves*, the publication of the Pennsylvania Forestry Association. Special effort was to be made for securing better observance of the laws regarding trespass upon and firing of forests, by the posting of notices of these laws in all suitable places.

After presentation to the Legislature the bill was referred to the Committee on Agriculture for further consideration. The advocates of the measure were granted a hearing before this committee, and endeavored to explain further the intent and value of it. No direct report or reply was ever received as a result of this interview, but it was understood that the bill was considered to be impracticable, even in a modified form, and it was never reported back to the House.

Whatever may have been the defects of this bill, it was framed with the intent to meet what many believe is a growing, and soon to be an imperative, need in our state, namely: Some systematic care and attention to the conservation of our forests, and their perpetuation over those large areas, chiefly mountainous, which ought to be not only continuously productive, but also centres of salubrity, and checks and barriers to climatic extremes. Meanwhile, the interest in forestry has continued to increase, and, although most active and visible in the eastern part of the state, is nevertheless becoming more and more evident in the others, and includes the intelligent, thinking men of various occupations and surroundings. From letters received from correspondents it seems in place to note very briefly the opinions of three, which may be taken as representative.

A farmer and lumberman of one of the north-eastern counties says: "The time is near at hand when no question will be of more vital importance to the Pennsylvania land-owner than that of how best to restore the wasted woodlands of the state. In solving this problem there is abundant room for both thought and work. It will not be wise to leave the work of restoration wholly in the hands of Nature, for while Nature can do and is doing much to reclothe the waste places in our forests, Nature does not always, in selecting species, give us those most useful to us, nor can she unaided successfully cope with tramps and incendiaries, private and corporate, whose carelessness or malice often, in a few hours, destroys the work of years. How can Nature's generous efforts in our behalf be best assisted? The state can do something. The act of June 1st, 1887, is good as far as it goes, but it does not afford adequate protection against irresponsible depredators. Forestry associations can do something, but much must be left to individual work. We have learned only too well how to get rid of trees, we need now to learn how to replace them. We shall find the last problem a harder one to solve than the other."

An engineer in active service with a mining company, having written a letter to the *Scientific American* on the timber

supply and forest-condition of northern Pennsylvania, says: "I wrote the article to which you refer entirely from a sense of duty—to raise the alarm, to call attention to the fact that people were being misled in the matter of bark and lumber supply left in the northern part of this state. Men who have traveled only on the railroads or who get their information from some one who is trying to 'boom' a county or section of country, write as positively on this subject as those who have traversed the valleys and climbed the hills where the lumberman is carrying on his work of destruction. I have none but a general interest in the matter—no lands, or bark, or timber for sale, nor do I expect to have; but it grieves me to see such ruthless destruction, such vandalism—if I may apply the word to the destruction of our forests—as is going on all around us. I am quite well acquainted with the condition of things in Tioga, Lycoming, Sullivan, Potter, Elk, Forest, Jefferson, Clearfield and Cameron Counties, but my knowledge of the state of affairs in McKean and Warren is quite limited. . . . One thing you may rest assured of, I put the case in its simplest form in my letter to the *Scientific American*."

One of the foremost politicians of the state, himself a large landholder and business man, says: ". . . Sooner or later these lands (those which have been stripped of their timber) fall back upon the county through arrears of taxes. The time is coming, if not already here, when the need of some adequate forestry laws will be seriously felt."

State College, Pa.

William A. Buckhout.

Correspondence.

Australian Trees in California.

To the Editor of GARDEN AND FOREST:

Sir.—The issue of GARDEN AND FOREST for December 4th mentions the probability of the Kauri Pine being adapted to California. That it will flourish in certain portions of the state is not a matter for surmise, as a stately specimen of the tree forty feet high stands upon the grounds of Mr. Sawyer, at Montecito, near Santa Barbara; nevertheless, neither the planting of this nor its equally beautiful and hardy congeners, the *Dacrydiums*, have been prosecuted to any noticeable extent in California.

Hitherto the impression has prevailed that *Acacia* and *Eucalyptus* were about the only genera that would conform themselves readily to our conditions of soil and climate; and the wonderful collection of Mr. Ellwood Cooper, at Santa Barbara, and the successful growth of no less than forty-six species of this latter interesting genus at the State Forest Station at Santa Monica, have helped, perhaps, to give color to this theory.

At this date (December 16th), and at this station, unprotected seedlings of *Lagunaria Pattersoni* are appearing vigorous and healthy, and when it is recollected that this tree is a native of the tropical Queensland "scrub," we may be warranted in holding somewhat optimistic views of the possible future expansion of the Australian silva in this state.

Outside of the *Leguminosæ*, *Protaceæ*, *Myricaceæ* and *Sterculiaceæ* our gardens and parks show a striking poverty in Australian plants—a poverty only less regrettable than the absence from them of our native trees and shrubs.

Mr. F. M. Bailey, in his recent (1888) monograph on Queensland woods, enumerates 537 species, of which only twenty-eight per cent. are tropical or ultra-tropical, leaving nearly 400 species of extra-tropical sorts that would doubtless accommodate themselves to various parts of California.

The locality first mentioned (Montecito) is exceptionally favored, even for California. Sheltered from strong winds, near enough the coast to insure the atmospheric humidity requisite for most jungle plants, and practically exempt from frost, it furnishes the climatic requirements of a semi-tropical arboretum.

In the gardens referred to is a noble Laurel—the *Persea gratissima* (Alligator Pear)—which, in August last, was fairly loaded with green fruit, and from which I recently received ripe fruits. In the same grounds, and amongst a unique collection of Palms, stand regal specimens of *Archontophoenix* (*Seaforthia*), *Cunninghamiana* and *Cocos plumosa* quite twenty feet in height. These two Palms, though no uncommon features of Santa Barbara gardens, have nowhere else in the state made themselves so fully at home. Ultimate success with Australian and other exotic plants in California depends upon close and impartial observations and records of soils and climate. The lowest official temperatures recorded at Los Angeles during many years past is twenty-eight degrees, and by private record only twenty-six degrees has been touched; yet six miles distant, at the Ostrich Farm, the mercury has fallen to

fourteen degrees—an amount of cold which killed the immature wood of *Nerium Oleander*, and quite sufficient to have destroyed any Queensland tree yet introduced here.

On the other hand, six miles in another direction (the Cahuenga) the Coffee shrub and *Artocarpus incisa* (Bread-fruit-tree) have grown unimpaired by frosts during four years; and though no authentic meteorological data are at hand from that quarter, the evidence shown is sufficient to warrant the hope for a liberal measure of success with even tropical Australian plants. The natural advantages of this point or of Montecito for acclimatization gardens are far superior to those of the Stanford Arboretum, and probably have no parallel upon this coast or within the United States.

Los Angeles, Cal.

William S. Lyon.

The Action of Root-hairs Illustrated.

To the Editor of GARDEN AND FOREST:

Sir.—A letter from Mr. James E. Reeves to Professor Joseph Leidy contains the following statements: "You may have noticed in the Associated Press dispatches two weeks ago, report of the re-interment of the remains of the Confederate General Walker, who was killed in the battle before Atlanta, July 22d, 1864. The specimen I have the pleasure of sending you is a part of the mossy network which completely covered the remains."

"The burial place was in a dry ferruginous clay, and the vault preserved unbroken by a thin crust arch which prevented the falling in of the superincumbent earth; and thus the remains—which consisted of nothing more than the bones, and some of these broken into dust—were all easily brought into view, with their remarkable covering."

Through the kindness of Professor Leidy I have had the privilege of examining the fragment of this "mossy network." I find it to consist of the ultimate rootlets of some plant, whether herb, shrub or tree I have no means of knowing. But the most striking thing revealed by the microscope is the vast number of root-hairs with which these rootlets are covered. It is quite clear what their function was. In fact, they afford an illustration of the absorbing powers of such appendages. Through their activity the mortal remains of the brave Confederate soldier had already had their resurrection into a new life by the leaves and flowers which covered his grave.

The fact taught by these root-hairs is well recognized, but I have never before seen so striking an illustration of it.

University of Pennsylvania.

J. T. Rothrock.

Kalanchoe carnea.

To the Editor of GARDEN AND FOREST:

Sir.—Mr. Dana's opinion of this plant will be endorsed by most cultivators; and yet the *Kalanchoe* has merit as a window-plant. It bears the dry atmosphere of hot rooms; it wears well, and its perfume is very agreeable where confined; and it may be much improved by selection. Already I notice some plants with decidedly brighter colors than the rest. It may be possible to cross it with some brilliant-colored species of *Kalosanthes*, such as *K. coccinea*, and if so, we may hope for some really valuable additions to our list of plants. I well remember how insignificant were the earliest comers among the Chinese Primroses (*Primula Sinensis*), with their puny flowers and insipid coloring. By selection extending over thirty-five years we now have some of the most beautiful colors and the most effective early winter-flowering plants in a class of plants that was once almost despised.

Pearl River, N. Y.

John Thorpe.

Recent Publications.

The California Fruits and How to Grow Them. By Edward J. Wickson. Dewey & Co., San Francisco. 1889.

Perhaps no country in the world excels California in natural adaptation to the production of fruit and its preservation. It combines the three great advantages of abundant heat, continuous sunshine and dry air, and these, taken in connection with a soil admirably suited for fruit-culture and a long growing season, ensure an abundance of fruit, which matures early and is of good quality. Besides this, the rainless summer, with its dry heat and steady sunshine, gives exceptional advantages for curing fruit in the open air. All these conditions would naturally prompt Californians to engage in fruit-growing; but when we consider how recently this industry was in its infancy, and consider, too, that the pioneers in the enterprise came from regions where the climate was radically different from that of California, we cannot but wonder at its rapid development. Of course many mistakes were made in the

beginning, and as there were no traditions of culture and no experience to rely upon, the early fruit-growers were compelled to experiment for themselves. Fortunately, they were men of exceptional intelligence, and the reports of their papers and discussions at the meetings of the State Agricultural Society and other bodies gave great aid to new-comers. It is rather remarkable, nevertheless, that so complete a book as this of Mr. Wickson's could be prepared out of actual experience in the orchards and gardens of the state. This manual is very comprehensive in its plan, treating generally of the climate of California and its modifications, giving full cultural directions to the fruit-grower from the proper method of clearing the land and of planting the nursery down to the preparation of the fruit for market. No doubt it will be found of great value to all those who are desirous to embark in fruit-growing in that region, but who have no practical acquaintance with the methods or materials to be used. The book, however, will find many readers outside of California. The wonderful variety of orchard fruits, semi-tropical fruits, small fruits and nuts, whose cultivation is here described, will astonish those who are not familiar with the resources of the Golden State. Very interesting is the chapter on the wild fruits of California and on the old fruits that were introduced into the early missions. The section of the work relating to the preservation of fruit is comparatively brief, but to the eastern reader it has a peculiar attraction on account of the magnitude of the operations which are there described.

Exhibitions.

Flowers at the Water-Color Exhibition.

THERE are some fair flower pictures in this year's water-color collection, but none of remarkable excellence. Miss Greatorex has sent none of her large paintings in which the color of great masses of blossoms is insisted upon with such splendid decorative effect; Mr. La Farge none of his exquisite little studies where the whole of a blossom's beauty is shown and a soul is suggested for it that only the poet's eye can see in nature; and Mr. Weir none of those dainty Roses which are dreams of flowers rather than real flowers. Instead we have a number of little works where simple portraiture of a more prosaic sort is attempted, and a few where a general decorative effect has been tried for, with flowers as the main but not the only motive.

Perhaps the most important of all is Miss Hooker's "Carnations," a large picture with the yellow, pink, white and dark red flowers, half in a white glass bowl and half on a white table-cloth. The composition is effective, the lighting well conceived, and the flowers well drawn, and neither too rigid nor too soft. In color the general effect is excellent, but this result has been attained by some sacrifice of strength of tint in the flowers themselves. Were they as truthfully portrayed in this as in other respects, there would be no deficiency to note in an excellent picture. By comparison all the other paintings of Carnations on the wall seem poor enough. As a rule the form of the flower has been neglected; we see only a featureless mass, sometimes too hard, more often too soft, without the vigor of outline or the beauty of detail which give a Carnation its character.

Roses are even more in favor this year than Carnations, usually one of the double pink hot-house varieties being chosen. Here again the chief fault is lack of form—or, perhaps, lack of substance. Even when the form is well made out the Rose looks as though it were composed of some wishy-washy material instead of the pliant yet thick, the soft yet waxy, the delicate yet heavy material that Nature uses. Much the best Roses in the collection, I think, are those by Miss Grace Pomeroy, which are unfortunately skied over a door in the west room. They are only a few flowers simply placed in a common ginger-jar, with the white paper for background. But they are well drawn, frank and true in color, and firm in body without being in the least "hard" in the painter's sense of the word. It is especially pleasant to see the foliage as well executed as the flowers, and not allowed to fade away into the background as though of minor importance. Miss Pomeroy calls these Roses *Bon Silène*. Would not a florist call them *Papa Gontier*? Miss E. E. Lampert does not paint Roses badly, but neither is her work exceptionally good; and most of the others who have tried them may well be left unnamed.

A different kind of work is called for by Hollyhocks, and Mrs. Nicholls' bold touch and nice feeling for brilliant color have represented them well, in tall stalks with white and red

blossoms. A delicate little picture is Miss Abbat's "White Sweet Scabious," where the flowers are grouped with other objects and the general color effect is good. Most of the Pansies are blotchy and watery—devoid of texture although nicer very often, in color. E. M. Scott sends some *Nasturtiums* in a glass bowl which deserve mention; Miss Williams an excellent study of pink Chinese *Primroses* growing in a pot, and H. A. Pressey a group of *Azaleas* in a green glass bowl, remarkable for the delicate completeness with which the fragility of the greenish white petals and the exquisite pliant outline of the blossoms are rendered. Miss Redmond's "Grapes" should not be overlooked, though they, too, are "skied"—California Grapes, blue, red and green, as hard, yet velvety and juicy, as the sun of the Pacific had made them.

But much the most interesting pictures of flowers in the collection are two which lie outside the customary limits of flower-painting—two landscapes in which masses of growing flowers form the dominant feature. One is Mr. Ross Turner's brilliantly handled "Garden of Lilies, Bermuda," where we see a Lily plantation in the foreground, with touches of brighter hues to relieve its borders, white houses in the middle distance, and the background on a slope of vivid green and interspersed with blackish evergreens, and a cloud-flecked sky that is likewise frankly green, although, of course, quite pale in tone. We can believe anything of the color in Bermuda, such marvels have so often been told us; and Mr. Turner's sky proves its verity by its harmony with the other tones in his clear scheme of color. His Lilies are really not painted at all; there is just a stretch of white paper flecked with yellow, to stand for their mass. But this mass is suggested in such delightful fashion that we are content to forget for once that Lilies have beautiful forms, enjoying the radiance of the snowy sheet which is stretched before us.

The second flowery landscape is Mr. Bunker's "Aster Garden." Here we have the summer of the north as against Mr. Turner's winter of the south; and it is hard to choose between their contrasting charms. Nothing could be more attractive to eyes tired of our winter's bareness than this huddled garden corner where great masses of China Asters (painted, like Mr. Turner's Lilies, for color effect simply) grow beneath a hedge of Sweet Peas, with *Coreopsis* starring the tall grass in front of them, and what seems to be an orchard stretching its shadowy breadth in the background. Of course, this is not the way to paint flowers when one wants to show the flowers themselves; but when it is their effect that is wanted—their beauty as they grow in masses of softly blended or sharply contrasted colors—then few water-color painters of the day could expect to succeed better than Mr. Turner and Mr. Bunker have succeeded here.

New York City.

M. G. Van Rensselaer.

Meetings of Societies.

At an adjourned meeting of the New York Forestry Association held at Columbia College on Monday afternoon, February 10th, a revised Constitution was adopted, and the following officers were elected: President, Morris K. Jesup; Vice-Presidents, Dr. C. K. Adams, President of Cornell University; Grover Cleveland, Willard Cobb, Mrs. D. G. Croly, George William Curtis, Rt. Rev. W. C. Doane, Warren Higley, Seth Low, President of Columbia College; Warner Miller, C. L. Merriam, Dr. J. S. Newberry, Ellis H. Roberts, Carl Schurz, Rev. Dr. R. S. Storrs, Dr. H. E. Webster, President of Union College; Gen. Egbert L. Viele; Treasurer, Thomas Denny, 30 Pine Street, New York; Recording Secretary, E. B. Southwick; Corresponding Secretary, J. B. Harrison, 52 William Street, New York; Executive Committee, William Potts, 35 Liberty Street, New York; Professor D. S. Martin, Edward M. Shephard, Benjamin Strong, W. A. Stiles.

The officers of the Association are *ex officio* members of the Executive Committee, and three members will constitute a quorum for the transaction of business. The Committee is authorized to fill all vacancies, and to elect committees for various purposes, and is clothed with all the powers of the Association as its representative when the Association is not in session. It was provided that no debts can be contracted, nor any appropriation made in excess of the money in the treasury available for the purpose.

The object of the Association is the promotion of effort for the maintenance of forest conditions on the mountain lands of the state. It does not now commit itself to any particular measure as final, or entirely adequate, but it will, as far as possible, co-operate with the State Forest Commission, and with all associations and citizens in favor of any judicious and

practical plans for the preservation and rational management of the Adirondack forests. It will devote itself systematically to the diffusion of knowledge and the propagation of sound ideas regarding the functions and value of this mountain forest region as the source of the great water-ways of the state, as a sanitarium, as a source of timber supply and as a preserve for fish and game. The Association invites the largest possible membership. The fee is one dollar per annum, which should be sent to the Treasurer, whose address is given above.

Notes.

Orange-growers in southern California have sold their Washington Navel Oranges on the tree for \$2.75 a box.

Snowdrops were in full bloom in the open ground in gardens near Boston last week, fully five or six weeks earlier than in ordinary seasons.

The December number of the *Journal of the Japanese Horticultural Society* contains a colored figure of a remarkable green-flowered Chrysanthemum of the Japanese type.

Professor J. T. Rothrock and Professor W. T. Wilson, of the University of Pennsylvania, have become associate editors of *Forest Leaves*, the organ of the Pennsylvania Forestry Association.

The best Baldwin apples from Maine and Canada sold at \$6.25 a barrel wholesale in Liverpool the first week in February; Russets ranged from \$4 to \$5.50, and Greenings from \$4.50 to \$5.

High praise is given in German journals to the Messrs. Henderson's Tuberose Excelsior Pearl, introduced some ten years ago, and to Albino, which they have recently put on the market, but which was first exhibited by Messrs. Mitchell at Chicago in 1887.

We recently spoke of the probability that the Okra-plant would soon be cultivated for its fibre. It is not generally known that in Texas it is already used for making lariats. In France it is used for making paper, and in India it is used to adulterate jute.

The House of Representatives of the General Court of Massachusetts passed a resolution on the 5th of February ordering the State Board of Agriculture to inquire into the condition of the forests in the state, the need and method of their protection for sanitary and other reasons, and the encouragement of tree-planting, and report thereon to the next General Court.

A correspondent from Media, Pennsylvania, sends the names of twenty-three plants which were in bloom there in the month of December. Of these, *Brassica nigra*, *Capsella Bursa-pastoris*, *Lepidium Virginicum*, *Viola cucullata*, *Stellaria media*, *Antennaria plantaginifolia*, *Nepeta Cataria* and *Symplocarpus foetidus* flowered through the month of January.

California journalists call attention to a fact which would seem strange enough in any portion of the globe less diversified in its surface than their state. At the time when the Central Pacific Railroad was blockaded for a week or more by gigantic snow-drifts, Roses were blooming and Oranges and Lemons were ripening their fruit only seventy miles away.

In the last quarterly report of the Kansas State Board of Agriculture the number of acres of artificial forest is given by counties. The totals are as follows: Acres of Black Walnut, one year old and over, 17,054; of Maple, 14,171; of Honey Locust, 3,415; of Cottonwood, 56,760; of other forest-trees, 120,172. The total value of the wood marketed for the year 1889 is placed at \$207,604.

A statue to Mr. James S. T. Stranahan is about to be erected in Prospect Park, Brooklyn, as an acknowledgment of his many services to the city, and especially of the prominent part he played in the establishment of the park itself. It is a pleasure to know that the work bids fair to be a genuine ornament to the beautiful pleasure-ground, as the sculptor chosen is Mr. W. F. MacMonnies, a native of Brooklyn, who has recently been studying in Paris, and of whose abilities Mr. St. Gaudens, his former master, speaks in the highest terms.

The fourth annual Orchid Show, which opens to-day at the Eden Musée, promises to surpass in varied interest any of its predecessors. As in former years, the exhibition will be under the direction of Messrs. Siebrecht & Wadley, who announce that they will contribute from their own collection 800 plants of some 300 distinct varieties in full flower. Besides these,

choice plants from several of the most important Orchid collections in various parts of the country have been sent here at great risk and expense. The exhibition will remain open for ten days.

Herr Otto Froebel, of Zurich, recently explained in *Gartenflora* that, after long experimenting, he had found *Rosa laxa* the best stock for grafting. It is a central Asiatic species, the seed of which was sent him some twenty years ago by Dr. Von Regel. It makes no suckers, easily accepts grafts of all kinds, and is thoroughly hardy in Germany; moreover, its stem naturally grows straight, smooth, unbranched and almost destitute of thorns to a considerable height, so it is especially well fitted for producing standards, while the early ripening of its wood peculiarly fits it for winter forcing.

A new hybrid Rose, raised at the Arnold Arboretum by Mr. Dawson, is just now flowering for the first time. It was produced by crossing the small, white flowered Japanese *R. multiflora* with pollen from the well known hybrid perpetual, General Jacqueminot. The offspring of this cross has the foliage, somewhat reduced in size, the branchlets and the spines of the pollen parent; the flower is solitary (not clustered as in *R. multiflora*), about an inch across, cup-shaped, semi-double, with bright pink petals; and, moreover, it has the real Jacqueminot odor. The plants, as far as they have been tried, are perfectly hardy, while most of the so-called miniature Roses with bright-colored flowers are tender in the severe New England climate.

Mr. Charles Howard Shinn writes from Niles, California, to the *Evening Post* that wealthy men looking for long investments can do something in the Pacific Coast region that will last for many generations, paying a larger interest than almost any manufactory in America. The investment recommended would be as nearly indestructible as anything human can be. He thinks that on irrigated lands on the lower Rio Grande, along the Colorado, or in portions of California, Nevada or Arizona, Date Palm orchards would last for ages and pay a steady profit. The Olive is already planted in large groves by associations looking for safe and permanent investments, but no one has planted a Cork-Oak forest. Dates, Persian Walnuts, the Figs of Smyrna, the Cork of Spain—all of these are constantly increasing in value; the world's supply is not keeping pace with the demand, and they offer new and attractive channels for large investments of capital as safe and permanent, he thinks, as brick blocks on the business streets of growing American cities.

Bulletin No. 63 of the New Jersey Experiment Station is a record of some tests with Tomatoes. From these it appears that nitrate of soda increased the yield invariably, but was most effective when used in small quantities at a time, and, as would have been supposed, when balanced by applications of phosphoric acid and potash. Contrary to a prevalent belief that chemical fertilizers make garden produce watery, tasteless and innutritious, the Tomatoes on the plots where nitrate was used were not only large, smooth and beautiful to the eye, but they were more solid and had fewer seeds than those on the other plots, and the chemical analysis proved their superior nutritive value. The crop was increased by the nitrate from thirty-five to sixty per cent. on the different plots. Considering ten tons an acre an average yield, and \$6.50 a ton an average price, the gain from the use of nitrate ranges from \$17 to \$39 an acre. This would make an important difference in a state where 15,000 acres are devoted to raising Tomatoes for canneries, besides some thousands more where Tomatoes are grown for market.

Catalogues Received.

ALFRED BRIDGEMAN, 37 East Nineteenth Street, New York; Seeds.—W. ATLEE BURPEE & Co., Philadelphia, Pa.; Seeds.—A. D. COWAN & Co., 114 Chambers Street, New York; Seeds.—HENRY A. DREER, 714 Chestnut Street, Philadelphia, Pa.; Seeds.—B. A. ELLIOTT Co., Pittsburgh, Pa.; Flowers worthy of General Culture, with descriptive and cultural notes.—ELLWANGER & BARRY, Rochester, N. Y.; Fruit and Ornamental Trees, Shrubs, Roses, etc.—R. & J. FARQUHAR & Co., 16 and 19 South Market Street, Boston, Mass.; Seeds, Bulbs, Plants, Tools, etc.—D. M. FERRY & Co., Detroit, Mich.; Seeds.—JOHN GARDINER & Co., 21 North Thirteenth Street, Philadelphia, Pa.; Flower and Vegetable Seeds.—GREEN'S NURSERY Co., Rochester, N. Y.; Fruit Trees, etc.—JAMES J. H. GREGORY, Marblehead, Mass.; Seeds.—D. HILL, Dundee, Ill.; Fruit, Shade and Ornamental Trees, etc.—R. D. HOYT, Bay View, Fla.; Tropical and Semi-Tropical Fruit Trees, etc.—J. T. LOVETT Co., Little Silver, N. J.; Fruit Trees, Shrubs, Evergreens, etc., with cultural notes.—D. LANDRETH & SONS, 21 and 23 South Sixth Street, Philadelphia, Pa.; Vegetable and Flower Seeds.

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Botany for Young People.

THE letter entitled "Mocking at Knowledge," which will be found on another page, calls attention to certain misapprehensions which are not uncommon. Indeed, there are many intelligent people who seem ready on all occasions to discourage the study of botany even in its simplest and most attractive forms. They would be shocked if charged with indifference to knowledge of other natural sciences, but they seem to consider a desire to study botany on the part of any young person as a foolish endeavor to pry into a subject so profound that only a "smattering" of it can ever be learned, and a smattering of knowledge is declared worse than entire ignorance. Another objection to the study is that the more one learns about plants the less will one appreciate their beauty. The scientific attitude is held up as the reverse of enjoyment; scientific knowledge is proclaimed to be deadly to artistic or poetic feeling. "Why," it is said by those who should have spoken more wisely, "can any one want to pull flowers to pieces to learn their hideous Latin names? What is the good of it in the end, and must it not destroy all sense of beauty which we, in our happy ignorance, enjoy so keenly?"

No one believes that a knowledge of astronomy destroys all pleasure in the splendor of the midnight sky, or a knowledge of geology all interest in the grandeur and variety of the earth's surface. But trees and flowers must not be studied unless the student is willing to exchange the pleasure of the eye for whatever barren satisfaction he may find in hard names and withered, dissected specimens. It is probable, however, that one cause of this odd belief is the idea that to study botany means simply to learn Latin names, and that the knowledge of these names is its own only end and aim. If this were true botany would indeed be a dry and not very useful study, although there would still be some benefit in being able to speak of plants exactly instead of inexactly, and to speak of any possible plant instead of a comparatively restricted number. But to learn Latin names is only the first step in learning to know the plants they represent—a needful step if one's knowledge is ever to amount to much, but in no sense an end or aim.

When a simple handbook can be used so that the name of a plant can be found in it (the common name, as our correspondent points out, always appearing with the scientific), then all other facts about the plant can be read at a glance; and unless this can be done most of these facts will never be gathered. Knowing the name, we find the manner of the plant's growth, the regions where it is common or rare, the character of the spots where it may most hopefully be looked for, its seasons of blooming and fruiting, and its relationship to other species, with the facts upon which this relationship is founded, as well as those which make its own individuality clear. Is not all this worth knowing, even at the cost of dealing for the moment with the ugliest of Latin names? If a child finds a rosy *Arethusa* with twin blossoms, will not his pleasure in it and his desire to search for other flowers both be stimulated by the knowledge that his treasure is a very rare one? Or if he discovers that the pretty little Bunch-berry which carpets some woody spot is first cousin to the big Flowering Dogwood, and discovers too the reason why, will not his interest in it be increased? Let him learn why an Orchid is an Orchid, why the tiny Ladies' Tresses deserve the name as much as the gorgeous *Cattleya* or *Oncidium* of the greenhouse, and he has gained something which surely cannot decrease his enjoyment of the beauty of either.

But to do this, it may be objected, beautiful flowers must be pulled to pieces, and this will "deadend the sense of beauty." By no means. The truth is quite the other way. No one who has not once pulled a flower to pieces can realize, in the great majority of cases, how beautiful it is. All its beauty is not in its larger features or on the outside of its cup. In the interior, in the hidden recesses where the great work of reproduction goes on in a myriad different ways, each more marvelous and admirable than the other—here resides a great part of the beauty of all flowers and the greater part of the beauty of not a few. Even if it led to nothing but a knowledge of Nature's delight in making the tiniest features of her productions lovely to our eyes, the close examination of floral structures would be well worth many hours of a busy man's time. Once this has been learned, we do not need always to see it. Seeing the flower as a whole, we not only know its name, habits and relationships, but remember its structure. The exterior suggests the interior, and a knowledge of the interior explains the lovely individuality of the envelope.

This is sufficient to prove, we think, that even a smattering of botanical knowledge is better than entire ignorance. Archbishop Whately long ago pointed out that this word has two distinct significations. One of these is a superficial acquaintance with a subject and some pretentious display of slight acquirement. The other simply means rudimentary acquaintance, and must be the beginning of all knowledge. Even the slightest smattering, in this latter sense, of botanical knowledge will greatly increase instead of lessening the enjoyment of any one who by nature has any love for flowers.

But there will be a further gain. Once let a person begin to study plants and he will desire to increase the list of his acquaintances; and then he will use his eyes as he never did before. He will discover beautiful flowers whose existence in the neighborhood none of his mocking friends ever suspected. He will see a hundred things where they will not see ten. Having learned to appreciate beauty on a small scale, he will seek for it instead of waiting for it to strike his eye, and will find it in the most unpromising places. He will delight in the exquisite beauty of the infinitesimal blossoms of the Door-weed on which passive, uninstructed observers will never have perceived a blossom at all; and will be enchanted by the flowers of the Pig-weed even, despised of the multitude, but honored by him as a treasury of interest. Nor, surely, will his new appreciation of such humble charms lessen his feeling for the splendor of the *Iris* he finds in the swamp or the *Meadow Lily* that flaunts by the way-side.

To learn enough to thus widen one's interest in Nature's products is not a very difficult task. Indeed, there is no other science in which a beginning is so easily made or gives so large a return in pleasure. Materials for study are everywhere at hand; no traveling is needed, no great exertion and no outlay of money. The needful tools are as easily procured. A single volume like Gray's "New Manual and Handbook" will give all requisite preliminary instruction, full descriptions of all plants within a very wide area, a glossary of terms to help out the weakest memory, and, as our correspondent says, a dictionary of common names. With a knife, a long pin and a common magnifying glass the student has all he wants; and plants, even when withered and dissected, make a litter to which no mother would object as she might to the materials of the boy who has a passion for flying and creeping things. A few weeks of work, with living plants to illustrate the printed text, will seem more like play than work, and will enable any young person to identify all the plants in the neighborhood of his home. Any one who knows what is meant by such a study of botany as suffices for this purpose, and what is its immediate return in the increase of enjoyment and the development of the observing faculties, may well be astounded that any prejudice against it should ever be harbored. Of all the sciences this is the one whose study should meet with every encouragement as a happy and useful employment for our young folks' summer hours.

In the last annual report of the President of Harvard College, recently issued, Mr. Eliot calls attention to the pressing need of a better endowment for the Gray herbarium than that establishment now enjoys. The income of the herbarium last year was only about \$3,300, two-thirds of which was derived from the copyrights which Professor Gray bequeathed to it. From this slender income, which, so far as regards the value of the copyrights, is liable to diminish rather than to increase as years go on, the salary of the Curator must be paid, the collection must be kept in order and extended, and the library kept abreast of the times.

The Gray herbarium is the national herbarium of America in everything but name. No other collection of dried plants in the new world equals it in size and in importance; and its value for reference will continue, although it is possible that larger collections may in time be formed in better endowed establishments. No other herbarium, however, whatever its financial strength may be, can ever possess so many of the type specimens of the American flora, or can supplant the Cambridge collection as the final place of reference for determining the identity of the plants described by Professor Gray and his associates. No critical student of American plants can take a step in his investigations without referring to the Gray collections, and their value is so great and so generally acknowledged that Mr. Eliot's appeal for a better herbarium endowment cannot long remain without a favorable response.

There is a pressing need in the herbarium of well trained and capable assistants, that the Curator may be relieved of the daily drudgery of caring for the collections, and be left to carry forward the unfinished "Flora of North America," on which Asa Gray worked for nearly half a century and left only half completed. It can be finished at Cambridge only and by an author thoroughly trained in systematic botany. This book is now more needed than any other work of descriptive botany, and no mere financial difficulty should be allowed to stand in the way of its completion.

Mr. Eliot asks for the sum of \$40,000 with which to endow the Gray herbarium. It appears to us that the sum is much too small, in view of the importance and reputation of the collection, and the extent and character of the botanical work the public has learnt to expect from Cambridge. What the Gray herbarium really needs is a permanent endowment which will produce an income of not less than twelve or fifteen thousand dollars; and its greatest

usefulness and efficiency cannot be secured with a smaller sum. Harvard College has for years been supreme in America in systematic botany, and she cannot now allow her position as a leader in this department of knowledge to be jeopardized through inability or unwillingness to properly support her great herbarium, or to pay the price of leadership.

A few weeks ago we spoke with approval of certain bills relating to our public forests which are now under consideration by Congress. It should not be forgotten, however, that the people who wish to convert the timber on the national domain to their own private use are quite as energetic as those who wish to protect it. There are some nominal safeguards in the forms of law already which are supposed to have been enacted to prevent the spoliation of the public forests, but owing to essential defects in the laws or their administration they have proved ineffective hitherto, as is well known. Even these laws, however, are looked upon as too much of an obstacle in the way of free access to the public forests, and a bill of Senator Teller's now before the Public Lands Committee seems to have been devised to enable everybody who feels so inclined to help himself and his friends to all the timber they can use or sell.

The bill is entitled "A bill authorizing the citizens of certain states and territories to fell and remove timber on the public domain for mining and domestic purposes," and it seems well contrived to accelerate forest destruction. The little formalities needed under this scheme to clothe any one with power to take timber from the public forests are to be entrusted to the registers and receivers of the Land Office, who already have more duties than they can properly perform, and altogether the timber-cutters would have a merry time under the provisions of the proposed law.

An Alley in the Tuilleries Garden, Paris.

THE garden of the Tuilleries was laid out, by Le Nôtre, in 1665. Since the Revolution its design has been somewhat modified, but most portions still show the arrangements of the great master of formal gardening design. Upon one side fronted the palace, which was destroyed in 1871, the ground it covered being now laid out with paths, lawns and flower-beds, as described in the article on "French Parterres," published in our issue for January 29th. This change has, however, only increased the beauty of the Tuilleries gardens, for, as we stand in their central alleys, the eye, instead of being stopped by the façade of the palace, looks over the newly planted ground into the vast court-yard formed by the Louvre, where rises the Arc du Carrousel, and beyond it a number of small, park-like enclosures with fine trees. All this large and beautifully arranged place and the great buildings about it were formerly concealed by the façade of the Tuilleries, and, therefore, admirable as this was in itself, its loss is more than made good. Again, standing back within the quadrangle, we now have, enframed in its wings, a majestic perspective unrivaled in any modern city—first, the Arc du Carrousel, then the brilliant new garden, then the massive plantations of Le Nôtre, and beyond them the obelisk of the Place de la Concorde, and past this the long, rising slope of the Champs Elysées, with the Arc de Triomphe standing majestically against the far distant sky. The long, gentle rise in the ground beyond the Place de la Concorde adds vastly, of course, to the effect of the picture, but only a nation with a true instinct for art in its most monumental phases could have utilized it to such good effect and brought it into one great composition with the Tuilleries gardens, a century and a half after these were formed.

The palace faced on one of the narrower sides of the garden as it lay by the bank of the Seine. Along this river-side and the remaining two sides as well, Le Nôtre arranged elevated terraces, planted with avenues of trees. At the western side, opposite the palace, two great curving stairways of marble lead to the terrace and the Place de la Concorde beyond; and smaller stairways rise on the river-side, and, opposite this, to the Rue de Rivoli. In our picture we see the houses that form the Rue de Rivoli, and, in the distance, the tall pavilion which finishes the north side of the Louvre and

once joined it to the Tuilleries palace. The terrace on this side is called "La terrasse des Feuillants," from a convent of Benedictines, or "Feuillants," which formerly adjoined it, and, during the early days of the Revolution, was the rallying place of the moderate republicans. It is thickly shaded with old Lindens, and in summer forms a delightful promenade overlooking, on one side, the busy street, and, on the other, the wide, quiet, graveled space called the "Allée des Orangers." The Orange-trees are wintered in a house that stands near the river, but in summer are set out in long lines, which add vastly to the dignity of the garden by their symmetrical, architectonic shape, and to its charm by the perfume they exhale. Many of the trees are very ancient, but they are well cared for, and, in form as well as profusion of bloom, satisfy the most critical eye. The wooden boxes in which they stand are painted a delicate, dull pale green, which contrasts well with their dark foliage and harmonizes well with the pale tone of the gravel.

The trees shown at the right of our picture indicate plantations of rectangular form which border both sides of another alley, likewise furnished with rows of Oranges. Here, not far away from the point where we stand in the picture, is a little café, ignored of the tourist—a low, isolated building with an awning and tables facing toward the interior of the garden. Stumbling on its quiet shelter, one can realize the blessing that his beautiful urban parks must be to the Parisian. We are thankful for a small, noisy space like Madison or Union Square. But here in the very heart of Paris there is little except the subdued roar of the Rue de Rivoli behind us to tell that a city exists. In front of the tables are Oleanders and Pomegranates blooming in pots; to the right and left stretches the long perspective of thick, straight-edged plantations supported by the lines of Orange-trees, and beyond is the charming reach of flowery parterres which once formed the private garden of royalty (shut off from the main garden by a moat, now bridged, and a railing, now removed), and still further, the stately avenues long ago planted by Le Nôtre in the centre of the Tuilleries enclosure. There can be nothing more delightful than such a scene on a warm, glaring day when one is surfeited with streets and men, for the quiet is enlivened merely by an occasional nurse-maid and her troop of little ones. But best of all, perhaps, is one of those days of alternate sun and shower which are frequent in Paris even in midsummer. Then the changes of light give each moment a new picture, newly tempting to the painter's hand; and under our protecting awning we can watch the white-capped nurse-maids scurrying before a shower with a little, yet not too much, of that feeling of pleasure in other people's misfortunes which one of their compatriots long ago declared to be a joy dear to all human hearts.

Holiday Notes in Southern France and Northern Italy.—XI.

NICE, a beautifully situated city, is one of the most popular of Mediterranean health-resorts. The mean winter temperature is ten to fifteen degrees Fahr. higher than that of Paris, and the mean summer temperature from five to ten degrees lower. February is the coldest month, and the mean temperature for that month—according to M. Teyseire's published records of twenty years' observations taken with instruments placed outside his window on a fourth floor facing the north-north-east—is forty-six and two-tenths degrees.

The fine avenue of *Eucalyptus globulus* near the railway station at once attracts the attention of the stranger at Nice; here the trees are of considerable height and bulk, and at the time of our visit the smooth polished, white or pink tinted stems looked very picturesque; the bark still hung in long flakes from the larger branches. In many places along the Riviera the *Eucalyptus* present but a sorry appearance; at Nice, on the contrary, they seemed to have soil which exactly suited their requirements. The famous Promenade des Anglais, with its long range of Date Palms, Oleanders, etc., presented nothing remarkable from a garden point of view, nor did the Public Garden, except a group of Pines, clothed with *Wistaria Sinensis*.

The gardens belonging to the King of Würtemberg scarcely repaid the trouble of a visit; as in nearly all the Riviera gardens, there was hardly a green blade of grass to be seen in mid-September, and beds of Zinnias, colored Amaranths, etc., only brought into greater relief the burnt up lawns. A sort of cascade and a piece of rockwork seemed altogether out of place. The only feature of special interest was the fence of tall black and yellow stemmed Bamboos; the first named was

Phyllostachys nigra (*Bambusa nigra* of gardens), with tall, polished, black stems, far higher and thicker than ever they are seen in England, and the other probably a species of *Arundinaria*.

Lambert's nursery is well worth a visit; various species of *Phoenix* were here cultivated in enormous quantities, amongst them *P. tenuis*, *P. Leonensis* (no doubt the south African *P. spinosa*), and *P. Canariensis*. Specimens of *Washingtonia filifera*, in tubs and in the ground, were numerous. Thousands of Camellias and Gardenias were also growing in nursery quarters; a goodly proportion of the latter would be taken up a little later and placed under glass in order to supply the demand for cut flowers during the Nice season. Amongst Ferns, *Pteris tremula* and *P. Cretica* were grown in large quantities, in the open ground, in beds, and also between the rows of Palms, etc. The establishment of Besson Frères is also well worth a visit, Palms and Bamboos being cultivated on a large scale. The fine rows of the Chusan Fan Palm, *Trachycarpus (Chamærops) excelsus*, in the grounds of the Paris Exhibition, mostly came from the nursery just named.

The Castle Hill, in the south-eastern portion of the city, about 320 feet high, is crowned by the ruins of the castle destroyed by the Duke of Berwick at the beginning of the eighteenth century. There are fine grounds—quite a forest of *Pinus Halepensis*, with stems taller and straighter than any we saw elsewhere along the Mediterranean—and Date Palms, Aloes, Agaves, etc., in abundance. Splendid views in all directions are obtained from above the pretty waterfall, which is fed by an aqueduct. During the period of our visit part of the grounds were closed to the public, being occupied by the tents of the soldiers who had been brought there on account of some fever outbreak in their barracks. The long lines of tents and the brightly colored uniforms under the waving Palm-trees lent an additional charm to a wonderfully pretty spot. On the north side of the hill are situated the different cemeteries, our coachman, with charming simplicity, pointing out one which he said belonged to the Protestants—that of the Christians, he added, is further over. It appeared to us that some of the steep slopes bordering the winding carriage drive to the top of the hill might have been clothed with Lentisk, Myrtle and other indigenous plants, which certainly would thrive better and produce a more pleasing effect than the Agaves, which had not soil enough to develop properly.

One of the specialties of Nice is candied Parma violets, which are sold in pretty little round boxes; the petals of Orange-flowers are also candied.

Kew.

G. Nicholson.

Foreign Correspondence.

London Letter.

HOW to make fruit-culture in England pay has become a problem of some considerable importance within the last two or three years, or, say, from the time when Mr. Gladstone made what is now known as the Great Jam Speech. In addition to the important work done in this direction by the Royal Horticultural Society, there is also the special effort made this year by the Fruiterers' Company, with the great influence of the then Lord Mayor at its back, and we have now a third body called the British Fruit Growers' Association. The objects of this new Association appear to be similar to those of the Royal Horticultural Society in respect to fruit culture, namely, to hold public meetings and conferences in various parts of the country, to collect information, reports, essays, etc., and publish them, to award prizes and certificates; in short, to propagate the gospel of fruit-culture in such a way as shall develop to the fullest the capabilities of the land and its cultivators in the production of hardy fruits. There is a wholesome tendency now toward rigorous selection; bad sorts are to be condemned from the housetops, so that no nurseryman will attempt to grow them; good sorts are to be as loudly recommended, so that none but these shall in future be planted. This is good work. The unwary public are too often persuaded to plant varieties of fruit-trees which are as worthless as Oaks as a source of marketable fruit. There are far too many varieties at present, and if the various societies which have undertaken to push this business succeed in weeding out all worthless kinds, they will have performed good work. What with conferences and reports on fruit exhibited, the public generally know, or ought to know, a great deal more about the merits of different kinds of fruit than they ever did before. Meanwhile, the great bulk of the apples consumed in England during the winter and spring are from America, and being much cheaper than English-grown fruit, they are, as a rule, more palatable than the English

apples offered by the ordinary dealer in winter. Two useful publications devoted to this subject are the cheap edition of Mr. Barron's "Conference Report on Apples," price one and sixpence, a most comprehensive, reliable and well arranged descriptive catalogue, with comments by the author, who is perhaps the first authority on fruits in England. The other publication is Mr. J. Wright's prize essay on "How to Make Fruit-growing Pay." This work was written for the Fruiterers' Company, and is a marvelous shilling's worth of practical information by an eminently practical authority on hardy English fruit.

GRAFTING.—Mr. Parsons' trenchant remarks on this subject are an overwhelming testimony against those ill-advised authorities who set out to convince English gardeners that they were being defrauded by the nurserymen who sold them grafted fruit-trees instead of own-rooted ones. It was difficult to believe that those who condemned grafting of all kinds as a makeshift and a fraud were in earnest. The crusade against grafting in England collapsed suddenly. Probably the Fruit Conferences, held recently, carried conviction to the minds of the few who appear to have thought that they had but to cry out against grafting to get it condemned.

ODONTOGLOSSUMS.—I learn that the cultivation of these plants in America is not so satisfactory as it is in England, owing to the excessive heat of your summers. Have these Orchids been tried in a cool, shaded position out-of-doors during summer? In Germany this treatment is practiced for cool Orchids with considerable success. Most *Odontoglossums* grow well in the open air during summer in England, and Mr. Sander has for several years practiced a method for the cultivation of these plants which may lead to their being grown in beds outside pretty much as we grow the Andean *Begonias* now, namely, plant them outside for the summer, lifting and resting them in-doors in winter. The method referred to is simply planting *Odontoglossums* in beds of peat in low span-roofed houses and treating them as if they were as terrestrial as *Disas*. The bed is formed by two walls supporting slabs of stone, and upon these is placed a layer of drainage, broken soft brick being preferred. About three inches of good rich peat, not fibre merely, but pure peat, is placed upon the drainage, and in this the *Odontoglossums* are planted in rows. Small plants with pseudo-bulbs an inch or so in length produce the first year under this treatment pseudo-bulbs as large and almost as plump as bantams' eggs. Out of what was originally I believe merely a makeshift plan for overcoming pressure of work, Mr. Sander has developed what was described recently by a very eminent botanist as the most astonishing of recent revelations in horticulture. It may, as I have already said, bring us to something not far from "bedding out" for epiphytal Orchids.

PHŒNIX ROEBELINI.—This is a very distinct and pretty little Palm lately introduced from Siam and now in the possession of Messrs. Sander & Co. There is no *Phœnix* like it, the nearest being *P. rupicola*, the most elegant of the species hitherto known. By the side of this, however, *P. Roebelini* is the veriest pigmy, its stems scarcely thicker than a walking stick and almost smooth, and its leaves a foot or so in length, regularly pinnate, the pinnæ as narrow and elegant as those of *Cocos Weddelliana*, shining dark green and plume-like. I have not seen so charming a Palm for a long time. Messrs. Sander hold the entire stock of it. Although introduced only last year, the plants are in good condition and well furnished with healthy foliage. As a table plant this *Phœnix* is certain to become a general favorite.

ERANTHEMUM AURANTIACUM.—The most attractive stove plant in flower at Kew now is this dwarf species of *Eranthemum*. The tallest of the plants is not a foot high, and they are all clothed with gray-green foliage, which forms a suitable foil to the bright scarlet color of the flowers. These are in erect terminal spikes, and whilst the open flowers are scarlet, the buds are bright yellow. A group at Kew is composed of some twenty plants of the *Eranthemum*, arranged under graceful Palms, etc., with a few plants of the rich indigo-blue-berried *Psychotria cyanococca*, whose bunches of fruit suggest miniature bunches of currant-grapes. Both these plants are raised annually from seeds, this method being preferable to cuttings.

EPACRIS.—The value of these plants in winter is appreciated here in all good gardens. A selection of the best varieties is grown for the Kew conservatory, and these, when in flower, are greatly admired. The plants are cut down hard in spring, started in a little warmth, then repotted and allowed to get well rooted in the new soil before being exposed to the outside air. With this treatment they make new shoots from a foot to eighteen inches long, and clothed their whole length with flowers. White, pink, crimson and variegated are the colors

of the flowers. The best varieties are the *Hyacinthiflora* kinds, and those represented by *E. miniata*. Unless they are cut well back and started in a brisk, moist heat in early spring, *Epacris* do not make the growth long enough and ripen it in sufficient time to ensure a good winter display.

London.

W. Watson.

New or Little Known Plants.

Rosa foliolosa.

THE *Prairie Rose* of the south-west is one of the more distinctly marked species of the genus as represented in America. In habit it is low, rarely more than a foot in height, spreading by running root-stocks and forming clumps. The stems are slender and leafy, often unarmed; the spines, when present, mostly slender and straight, or nearly so. The leaves are nearly or quite glabrous, pale green and shining above, of seven to eleven small, narrow leaflets, which are acute at both ends, or only acutish at the apex, and simply toothed. The narrow stipules are usually glandular-ciliate, and the stalk of the leaf prickly. The rather large flowers are bright pink and very fragrant, almost always solitary and on quite short pedicels. The depressed-globose hip and the sepals are glandular-hispid, and the outer sepals narrowly lobed.

This little *Rose* was first collected by Thomas Nuttall during his early visit to Arkansas in 1818-20, but was not published until twenty years afterward, when it was described in Torrey and Gray's "Flora of North America" (vol. i., p. 460). Meantime it had been found by Berlandier and Drummond in Texas, and by other collectors. It appears to be confined to the prairie region of Arkansas, the Indian Territory, and northern and central Texas. A nearly allied species (*R. Mexicana*), found by Dr. Palmer in the mountains of Coahuila, Mexico, is the only species known to be native in Mexico proper.

The accompanying figure, on page 101, was drawn by Mr. Faxon from a specimen cultivated at the Arnold Arboretum.

S. W.

Cultural Department.

An Analysis of Grafting.

IT is well nigh incredible that any doubt can exist as to the general efficiency or necessity of grafting; and yet the discussions which have run through various journals, mostly foreign, during the last twelvemonth, indicate that the entire utility of the practice is questioned. A careful attention to the discussion reveals the fact that much of it is random, and that generalizations are too often made from local or insufficient facts. We often find that the truth is overlooked or obscured because of the lack of clear-cut definitions and analyses; such is particularly well illustrated in the perennial discussions of "acclimation," concerning which no one knows what his neighbor is talking about.

The practice of grafting—if we use the word to include both grafting and budding, after the manner of the French *greffage*—is so universally and unhesitatingly accepted by nurserymen and growers that no fear of its abandonment need be entertained, no matter what authority may condemn it. But we do need to know more about it, for ever since the absurdities of Pliny and Columella were recorded, it has been a fertile field of misconception and quackery. I do not wish to offer a defense of the practice; none is necessary. But a simple outline of reasons and results, with no attempt to multiply examples beyond the point of mere illustration, may serve a purpose.

It may be said that there are three leading reasons for grafting:

I. To perpetuate a variety. II. To increase ease and speed of propagation. III. To produce some radical change or promote some adaptation in the stock or cion.

The first two statements need no elaboration here, but the third is moot ground, and demands subdivision. These secondary results of grafting, as they may be called, or reciprocal influences of stock and cion, fall readily under the following heads:

1. Grafting may modify the stature of the plant. It is the commonest means of dwarfing plants. We graft the

Fig. 22.—*Rosa foliolosa*.—See page 100.

Pear upon the Quince and the Apple upon the Paradise Apple. This dwarfing usually augments proportionate fruitfulness.

2. Grafting may be made the means of adapting plants to adverse soils. Illustrations are numerous. Many varieties of Plums, when worked on the Peach, thrive in light soils where Plums on their own roots are worthless. Conversely, some Peaches can be adapted to heavy soils by working on the Plum. If dwarf Pears are desired on light soils where the Quince does not thrive, recourse is had to grafting on the Mountain Ash, or some of its allies. In some chalky districts of England the Peach is worked on the Almond. Some Plums can be grown on uncongenial loose soils by working them on the Beach Plum. Professor Budd states, GARDEN AND FOREST for February 12th, that the Gros Pomier Apple is particularly adapted to sandy land and the Tetofsky to low prairie land, and that these stocks are often selected to overcome adversities of soil. Such instances are frequent, and demand greater attention from cultivators.

3. Grafting may be made the means of adapting plants to adverse climate. This may be brought about by either or both of two causes: (a) The early maturation of the stock, causing the cion to ripen better. The Oldenburgh Apple is a favorite stock in severe climates for this reason. The Siberian Crab often has the same influence, although its use is open to serious objection. (b) A slightly imperfect union, causing the cion to mature or ripen early. This fact has been observed in many cases, notably in some instances of Apples upon improved Crabs, and yet the union is often perfect enough, nevertheless, to maintain the plant in a profitable condition for years. There are some adaptations to climate, however, which are not explained by either of the above hypotheses.

4. Grafting may correct a poor habit. All propagators are aware of this fact. The Canada Red Apple is usually top-worked to overcome its weak and straggling habit. The Winter Nelis Pear is a familiar illustration.

5. Grafting is often the means of accelerating fruitfulness—i. e., plants are made to bear at an earlier age. Those who test new orchard-fruits are familiar with this fact. Cions from young trees bear sooner if set in old trees than when set in young ones. This result may be due to the same causes which abbreviate the vigor of plants, as already outlined (see § 3, above). Checking growth induces fruitfulness.

6. Grafting often modifies the season of ripening of fruit. This is brought about by different habits of maturity of wood in the stock and cion. An experiment with Winter Nelis Pear showed that fruit kept longer when grown upon Bloodgood-stocks than when grown upon Flemish Beauty-stocks. The latter stocks in this case evidently completed their growth sooner than the others. Mr. Augur cites an instance in which the Roxbury Russet, grafted upon the Golden Sweet, which is early in ripening, was modified both in flavor and keeping qualities. "Keeping qualities" is but another expression for "season of ripening." These influences are frequent; in fact, they are much commoner, I am convinced, than we are aware.

7. Grafting often augments fruitfulness, largely for the same reasons as discussed in § 3. There are some anomalous instances of increase of fruitfulness, which are difficult of explanation—e. g., some citrus fruits are more productive when grafted upon *Limonia trifoliata* than upon their own roots.

8. Grafting often delays the degeneration of varieties. In various ornamental plants this influence is marked, as compared with plants from cuttings. It is recorded particularly in certain Roses and Camellias.

9. Grafting sometimes increases the size of fruit. The best illustrations of this fact are found in certain Pears when grown upon the Quince—the fruit is often larger than from standard trees.

10. Grafting may result in a modification of color of foliage, flowers or fruit. Assumed influences of this character are frequently recorded, but it is not always possible to determine how much of the modification may be due to soil, climate and treatment. The best instance which I now recall occurred in my own practice. *Prunus Pissardi* gave much more highly colored foliage when grafted upon *Prunus Americana* than upon *P. domestica*. The cions came from the same tree, and the grafted trees stood in the same row. Any acceleration in ripening of fruit (as indicated in § 5) is apt to cause high

color, but the intensification of color in *Prunus Pissardi* was not due to such cause, as the grafts were more vigorous upon *P. Americana*.

11. Grafting may influence the flavor of fruit. There can be no question but that apples often derive acidity from the stock when worked upon the Wild Crab or upon the Siberian Crab. It is commonly supposed that the Angoulême and some other pears are improved in flavor when grown upon the Quince. Downing asserts that some varieties "are considerably improved in flavor" by working upon Quince.

A favorite illustration in support of the reciprocal influences of stock and cion is the fact of transfer of color or variegation by grafting. Darwin called attention to this phenomenon, and used the term "graft-hybrid" to designate the mongrel offspring of certain unions. But this class of phenomena seems to follow inoculation rather than grafting *per se*. The transferable nature of variegation is well known in certain species, but it is entirely inexplicable in the present state of our knowledge; it seems certain, however, that it does not merit attention under a discussion of grafting. So long ago as 1727* variegation was designated a "distemper," which "may be communicated to every plant of the same tribe by inoculating only a single bud." In our own day Morren has called it the "contagion of variegation."

The above outline illustrates the fact that the results of grafting are profoundly modified by conditions. Adverse conditions must give unsatisfactory results, and may lead to a premature denunciation of the whole system of propagation upon the roots of other plants. But, on the other hand, proper conditions and good execution afford abundant and positive proof that grafting—using the word in its broad sense to include budding—is essential to best success in many departments of horticulture.

Cornell University.

L. H. Bailey.

Garden Flowers and Fruits in Midwinter.

THE mildness of the present winter and the evidences of it as shown by the condition of vegetation in consequence, have been a subject of frequent comment in the horticultural papers of the country. Such winters as this has so far proved in the region about Boston, although not common, are by no means unknown. The winter of 1888-'89, although generally considered very mild, was much colder than this. It is not often that, even in a southern exposure in New England, Snowdrops may be gathered in abundance in January and February, as has been the case this year, or that the sweet-scented single Violets can be found in any number. In a well known garden near Boston a clump of Christmas Roses (*Helleborus*), growing on the south side of some shrubbery, began blooming in November, and in the second week of February still continued to bear in perfection handsome white blossoms. The only protection given was that of a small box with a glass top during the coldest days and nights.

The herbaceous plants, however, play but a very small part in giving interest and ornament to the New England garden in midwinter. It is naturally from the trees and shrubs that the greatest pleasure is to be derived, and the shrubbery that is planted with a judicious selection of those species which retain their foliage or fruits, or which are distinguished by bright colored stems and branches, is certain to lend much brightness to otherwise wintry aspects.

A few shrubs are deservedly valued for their persistent bright fruits, and this winter one or two at the Arboretum are conspicuous by their flowers. The Japanese Witch Hazel (*Hamamelis Japonica*), which is still rare in cultivation, was, on February 5th, almost in full bloom, many of the anthers of the open flowers having shed their pollen; and a week later the plants were in their best and handsomest condition, the small branches bearing a profusion of pretty pale yellow blossoms. Of all early flowering shrubs this may be counted the most valuable, as it will add a new and cheerful feature to our gardens in late winter. The beauty of the flowers does not appear to be at all affected by alternate slight freezings and thawings, and they remain conspicuous for several weeks. This plant is said to become a small tree twenty feet or more in height in its native country, and as it is perfectly hardy here, it may also be expected to attain large size. It may be added that the plants in the Arboretum collection are grafted upon stock of our native Witch Hazel (*H. Virginica*), and appear to thrive well although they grow rather slowly. The *Hamamelis arborea* of European catalogues is a synonym or but a garden form of this Japanese species.

The common European Hazel (*Corylus Avellana*) was found

freely shedding its pollen on February 5th, and, although not a very striking plant at this season, the pollen-bearing catkins are interesting and graceful. A week later the European Alder (*Alnus glutinosa*) was in flower, growing in a sheltered situation beside a running brook. Two closely allied Asiatic Honeysuckles (*Lonicera fragrantissima* and *L. Standishii*) opened a few of their fragrant flowers and ripened anthers early in February. The buds are among the easiest and quickest to develop and expand into blossoms when cut off and taken into the house in winter, and they well repay the trouble, for the fragrance is as sweet as that of violets. *Erica carnea* does best when slightly protected in winter, and if the covering is removed it will be found in a good state of bloom. This is nothing new, as a part of the rosy colored blossoms open in the autumn and the rest in spring. In the same way a few open flowers may be detected on the racemes of *Andromeda floribunda*, and also on *Andromeda Japonica*, in warm situations.

Chief among showy winter fruits would rank the bright red or scarlet of the Mountain Ashes (*Pyrus Americana* and the European *P. aucuparia*), if, in this latitude, the birds did not almost invariably eat them early in the season. As being less liable to be devoured, the next best large-growing plant is the Cranberry-bush (*Viburnum Opulus*), the fruit of which, although very soft and somewhat shriveled, and not in a state to handle, is still quite conspicuous in large pendulous clusters. The scarlet fruit of the Black Alder (*Ilex verticillata*) remains firm and fresh-looking, as does that of the more sparsely fruited *I. laevigata*, but it often appears faded on the side much exposed to the sun.

A number of species of native and foreign wild Roses retain firm-looking and sometimes bright-colored hips throughout the winter, and among them all our native Swamp Rose (*R. Carolina*) is most pleasing and showy, with large corymbs of somewhat bristly dark scarlet fruit. Among Cotoneasters the species known as *C. Simonsii* is the most pleasing winter-fruited one in the Arboretum. The fruit is large, smooth, and bright scarlet in color. The Evergreen Thorn (*Crataegus Pyracantha*) is not as hardy as could be desired in New England, but in some situations gives satisfaction by its evergreen habit and especially by its bright fruit. The Washington Thorn (*Crataegus cordata*) is the only other species here which retains fruit with much color. Much has already been said of the permanent beauty of the fruit of *Berberis Thunbergii*, and its praise is well deserved. Although it is possible that its value as a winter food-providing plant for game birds may be overestimated by some, there is no question of its ornamental character. Its fruit is still the brightest of all the shrubs, and that of no other Barberry approaches it in beauty at this season. The upper berries of the bunches of Coral-berries or Indian Currants (*Symphoricarpos vulgaris*) become sunburned, but most of them retain a bluish red or crimson color; and the conical panicles of fruit of the Sumachs (*Rhus typhina* and *R. glabra*) are red, in some cases having a brownish tinge.

Of black-fruited plants there are several which keep their fruit in a full and unfaded condition. Few of the berries of these remain so bright as that of the common Privet (*Ligustrum vulgare*). There is a yellow-fruited variety of this (var. *xanthocarpa*) which, although not rare, is not often seen. *L. Iboia*, an Asiatic species, bears fruit in greater abundance than the common Privet, and it is also smaller and more loosely set on the panicles. It is black, with a heavy, persistent bluish bloom, and may be considered more interesting than strictly ornamental.

Arnold Arboretum.

J. G. Jack.

Fern Notes.—II.

IN considering Ferns suitable for cool-house culture there is an embarrassment of choice. So many excellent species and varieties are adapted to this treatment that it is impossible to mention more than a very small proportion of them here. Some hints were given last week about a few of the strong-growing sorts, and attention is now called to a limited list of more dwarf species, many of which are quite distinct in character. In establishing a cool-house collection of Ferns a few *Gleichenias* must be chosen, because they are undoubtedly among the handsomest plants of their class; and while they will attain quite a large size, yet they may be kept within reasonable bounds for a number of years, and when well grown always excite the liveliest admiration. Among the species of this genus most suitable for small collections are *Gleichenia dicarpa*, *G. Spelunca*, *G. semi-vestita*, the latter being much like *G. dicarpa* in general appearance, and *G. dichotoma*, *G. rupestris* and *G. Mendelii* are also good; *G. flabellata*, though a

* Bradley, "Ten Practical Discourses Concerning the Four Elements, etc.," 71.

splendid species where fit accommodation can be provided for it, is rather too large for a small fernery. The *Gleichenias* may be increased by division, but in performing this operation it is safest to sever the rhizomes some time before potting them off, so that the pieces may become well rooted before finally removing them from the parent plant.

Hypolepis distans, a well known and very pretty Fern, grows best in the cool fernery, where it soon makes a dense mass of its dark green, finely divided fronds. It is readily increased by division of the rhizomes, the latter being of rapid growth, and with some slight attention after the division is effected the young plants soon become established. *Doryopteris nobilis* and *D. palmata* are both excellent plants, and form a good contrast with some of the finer-leaved Ferns, the bold, strong foliage of *D. nobilis* being very effective. Some of the *Lomarias*, notably *L. ciliata*, *L. gibba*, *L. gibba crispa*, *L. fluviatilis* and *L. nuda*, may be highly commended for the cool fernery,

Another most interesting form is our native "Walking Leaf" (*Camptosorus rhizophyllus*); its indefinite manner of growth from the apex of the frond, from which it produces young plants, is well known, and gives some propriety to the above local designation. A plant of similar characteristics, though perhaps not so widely known, is *Fadyenia prolifera*, a Jamaican Fern of much smaller growth than the *Camptosorus*, though having the same habit in regard to the proliferous nature of the barren fronds. The fertile fronds of *Fadyenia* are of a different character, being simple, erect and about six inches in height, and do not add greatly to the beauty of the plant, as they wither as soon as the spores are ripe.

If the conveniences are at hand for their culture a few of the beautiful Filmy Ferns should find a place in the collection, but unless a well-shaded and moist corner can be given them, it will be found best to grow them in a case, so that their atmosphere may be more easily control-



An Alley in the Tuilleries Garden, Paris.—See page 98.

being not only easily grown and propagated, but also very ornamental in character. The *Lomarias* in general do better under cool treatment than in a stove temperature, besides being less liable to the attacks of thrips and other insects.

Many of the *Nephrodiums* (*Lastreas*) may be counted among hardy Ferns, but there are some that require cool-house cultivation, and among the latter, *N. glabellum*, *N. Sieboldii* and *N. opacum* (or *varium*) are all good sorts, and well worthy of a place even in a small collection. A few of the Fern curiosities, or oddities, can be included in this brief list—for instance, *Polypodium* (*Niphobolus*) *Lingua*, *P. Lingua variegatum* and *P. Lingua corymbiferum*; the leathery-looking, simple fronds of the two first and the much-divided and crested ones of the last are all equally quaint and interesting. These *Polypodiums* are natives of Japan and China, and are chiefly increased by division of the rhizomes.

Such gems as *Iodea superba* and the so-called "Kil-larney Fern" (*Trichomanes radicans*) should not be neglected; and there are many of the *Hymenophyllums* which require similar treatment, though some of the latter are not benefited by being sprinkled overhead as is *Trichomanes radicans*.

Davallia strigosa and *D. hirta cristata* are both handsome species, the latter especially so, and making also a splendid exhibition plant. *Nephrolepis exaltata*, *N. pectinata*, *N. Duffii* and *N. rufescens tripinnatifida* are among the most useful of their genus, being particularly good for planting out on rock-work or for using in baskets. The *Pellæas*, *Nothochlænas*, *Polypodiums* and a multitude of other valuable Ferns cannot now be mentioned, but the intention is only to direct the attention of some inquirer toward this most beautiful and interesting class of plants.

Holmesburg, Pa.

W. H. Taplin.

Begonia manicata.—This is a beautiful old species from Brazil, and, under liberal treatment, one of the most useful in cultivation. It is of moderately free growth, and forms a neat specimen when young. The short, fleshy stems are well clothed with large, oblique leaves of a glossy green color, the footstalks of which are encircled, irregularly, by little hairy scales of a bright reddish color; similar scales appear also on the veins that prominently mark the under side of the leaves, and sometimes on the flower-stalk. The pale pink flowers are small, but very freely borne in erect and large branching panicles; they are exceedingly decorative, and continue in full beauty for a considerable period. The plant may be readily propagated from cuttings—inserted in sandy soil, and placed where they may obtain a moderate amount of bottom-heat, with shade from sunshine till rooted—at any season. During summer they should be shaded from bright sunshine, and kept near the glass, in a house that affords an intermediate temperature, with a moist atmosphere; in winter shading will be unnecessary, and, as that is the flowering season, a somewhat drier atmosphere will then be requisite. The flowering season may be prolonged by the administration of weak liquid manure occasionally. When this season has passed the plants should be cut back slightly, just sufficient to keep them in proper shape, as they are liable to assume a disorderly appearance as they grow old, rested for a brief period, and then reotted.

Habrothamnus elegans.—Ever since its introduction, some fifty years ago, this plant has enjoyed the greatest popularity among the owners of greenhouses in Europe. In this country it is, unfortunately, not quite so popular, but few who see it well grown will rest contented until it has been added to their collections. To see the plant in all its gracefulness and beauty, and to understand that such perfection in culture can be attained with the greatest ease, by no means conveys a complete idea of its meritorious character. Add to these qualities the fact that its beauty continues throughout the entire year, and is most intense during the dull periods of winter and spring; add further the fact that it requires only enough artificial heat to exclude frost, and you will have gained a fair estimate of its utility. It is, in this climate, essentially a greenhouse plant, but it is not at all tender. In its native country of Mexico it grows at an altitude of 4,000 feet, and that fact indicates its comparative hardiness. It is a rather tall-growing shrub, of somewhat slender growth, with dark green, ovate-lanceolate, alternate leaves. The younger branches and the under side of the leaves are pubescent. The tubular flowers, about an inch in length and of a reddish purple color, are freely produced in dense terminal cymes. When the flowers are artificially fertilized, they are succeeded by brilliant red berries, that lend the plant an additional charm. It is seen at its best when planted in a border and trained on a pillar, trellis or the back wall of a lean-to house; in such positions it grows and blooms continuously. When grown in pots it should have abundance of root-room, and an occasional application of liquid manure helps it materially. As the flowering shoots proceed from the previous season's wood, some special care must be exercised in the matter of pruning; these operations, however, are necessary only when the growth becomes too dense or when the plant gets beyond its proper limits. Cuttings, made from firm young shoots, produce roots very readily when inserted in sandy soil during spring or summer, and kept shaded for a few days. Under the more recent name of *Cestrum elegans* this plant is now known to many.

Botanic Gardens, Cambridge, Mass.

M. Barker.

Correspondence.

A So-called "Poisonous" Primrose.

To the Editor of GARDEN AND FOREST:

Sir.—The literature of the alleged poisonous character of the *Primula obconica* commences in GARDEN AND FOREST. In its issue for May 2d, 1888, Doctor James C. White, of the Harvard Medical School and a specialist in skin diseases, states that he was consulted "by one of our largest dealers in flowers, for an inflammation of the skin of the hands and face. The appearance which these parts presented indicated a *dermatitis venenata* of an eczematous type." The florist attributed his trouble to some plant that he had been handling, and suspicion fell upon an *Acacia pubescens* and *Primula obconica*. Some of the florist's assistants were attacked in a similar manner. This skin trouble did not appear until after the plants were brought into the shop and were handled in large quantities. To confirm his suspicions, Doctor White wrote to Professor Goodale, of Harvard, asking if he had ever

known this *Acacia* or this *Primula* to cause skin troubles. Professor Goodale referred the matter to the gardeners at the Botanic Garden, and replied: "Our gardeners say that they have not experienced any trouble from *A. pubescens* or *P. obconica*, but that there is a plant, as yet undetected, which has lately given them a good deal of irritation." Early the following year Dr. White returns to the subject, and in GARDEN AND FOREST of February 20th, 1889, page 94, after referring to the issue of the previous year, he says: "The florist and some of his assistants, whose skin disturbance, therein (last year) described, *dermatitis venenata*, subsided in a short time, and the skin of the three affected persons has remained in a healthy condition until recently. Within the last two or three weeks, however, they have all manifested a recurrence of the same symptoms in about the same degree as last year." *Primula obconica*, one of the suspects of the former year, they now feel assured is the cause of the trouble, as this did not manifest itself until this plant came into the store for sale and had been freely handled in making up floral decorations.

The next evidence comes from Joseph Meehan, of Germantown, Pennsylvania. In GARDEN AND FOREST for March 27th, 1889, Mr. Meehan quotes from a letter of David Cliffe, who, after potting a lot of *Primula obconica*, had his face so swollen that he remained completely blind for a day. This was the severest case yet reported; but it should be stated that Mr. Cliffe was at that time suffering from poisoning by *Euphorbia (Poinsettia) pulcherrima*. Mr. Meehan states that he himself is obliged to avoid contact with Poison Ivy (*Rhus Toxicodendron*), and that the seeds of Oregon Maple (*Acer macrophyllum*) and of Hop Hornbeam (*Ostrya Virginica*) excite itching and inflammation of his hands, while many others who have handled them are not at all affected. These seeds, he states, "are both covered with minute hairs." On June 12th, 1889, GARDEN AND FOREST published a note from Mr. John N. Gerard, of Elizabeth, New Jersey, in which he gives the testimony of a lady who, with several daughters, had experienced most serious inconvenience from handling *Primula obconica*.

English gardeners, as a rule, do not appear to be so susceptible to the irritation caused by *Primula obconica* as do our own, or it may be that the plant grown in the humid climate of Great Britain has its irritating properties less conspicuously developed than in this country.

It is certainly singular that so many should have suspected *Primula obconica* as the cause of annoying skin troubles in themselves and others, without closely examining the plant. A pocket magnifier of moderate power would have revealed such a condition of hairiness that would have suggested further examination with a compound microscope. Both surfaces of the leaves, and especially their margins, show a great abundance and variety of hairs, while the petioles or leaf-stalks are conspicuously hairy, as may be seen without the aid of a glass. To one interested in *Trichomes*, this plant presents material for study in great abundance and variety.

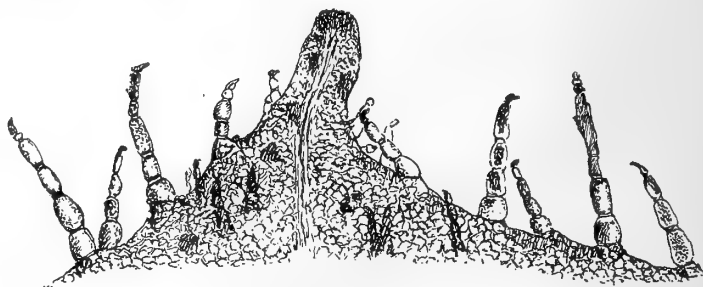


Fig. 23.—Magnified leaf-hairs of *Primula obconica*.

At my request, Mr. John Payne has made a drawing of a fragment of a leaf as it appears under a microscope. This shows the hairs which fringe the margins of the leaves and the calyx-lobes. The large projection in the engraving is one of the teeth upon the margin of the leaf. The surface of a leaf shows some hair like those on the margin, others much shorter and some much longer and weaker. The hairs upon the petioles, so long as to give them a shaggy appearance, present, under the microscope, a great variety in appearance. The hairs are seen to be made of many cells placed end to end. These cells are oblong in outline and diminish slightly in size from the base upward. Frequently one of these cells is much narrower than the one above and the one below it, appearing like a mere stem connecting two parts of the hair. This occurs in no particular portion of the hair, and sometimes there are two constrictions of this kind in the same hair. In many plants the cells have a deposit of silex. This

is the case with *Primula obconica*. If a portion of a leaf, including a portion of the margin, or of the calyx, be simply boiled in nitric acid, the contents of the cells will be removed, leaving a skeleton of the cells in siliceous, and in this *Primula* the hairs are shown to have a silicious skeleton. All traces of the acid being removed by abundant washing, the specimen may be mounted. The large proportion of silica in the hairs of this *Primula* would tend to render them brittle; it would also give them firmness to penetrate the skin when the plant was handled, and, breaking off, they would remain and cause irritation. Has any one examined the skin of an affected person with a magnifier to see if the hairs were remaining in the skin? I did not meet with the only person among my friends whom I know to be affected by the *Primula* until long after the irritation had ceased. Some have likened the effects produced by *Primula obconica* to those of *Rhus Toxicodendron*, the Poison Ivy, but it is a well established fact that many persons are poisoned by *Rhus* without coming in contact with the plant. Merely passing near it or being near a fire where it is being burned is sufficient to cause serious poisoning, indicating that the active principle is volatile. In stinging with Nettles an acrid liquid is said to be injected into the wound made by the stinging hairs. Is the irritation caused upon the skin of those who handle *Primula obconica* any different from what would be caused by a multitude of very fine pine or other splinters? Those who have traveled in the Cactus region of Arizona and neighboring territories are well aware of the irritation that may be and often is caused by the entrance of minute spines into the skin, and do not need to consult a work on *dermatitis venenata* to learn if the Order *Cactaceæ* has furnished, among its eighty-six genera, one or more species which have been known, upon good authority, to produce some degree of inflammation of the skin by contact. The one thing needed in the case of *P. obconica* is a careful investigation as to the character of the disturbance it causes and how it produces it. If, as now appears probable, the hairs with which the plant is abundantly provided are the cause, do these hairs inject any acrid liquid or other substance into the skin? Though contact with the plant is said to produce skin-poisoning, is there any proof of the presence of a poison of any kind as that term is generally understood? What proportion of those who handle the plant are unpleasantly affected? Are persons of a peculiar habit or complexion more susceptible to its effects than others? If these points appear trivial, it should be considered that no plant has been introduced into cultivation in a long time possessing so many elements of popularity as *P. obconica*. It is of great value to the florist, to whom its ready propagation, its abundant and continuous bloom and its adaptability to bouquet and decorative work all commend it. But to the amateur cultivator and lover of plants, whether he cultivate it in the window garden or elsewhere, it is an almost perfect plant. In view of its irritating qualities, some conscientious florists have ceased to offer it for sale, and it promises to pass out of cultivation altogether. With the hope of averting what would be a floral calamity, I plead for investigation, that we may know the extent of the evil. Before it is too late it will be prudent for those microscopists interested in the study of minute plant structure to secure material while it is still to be had.

Passaic, N. J.

George Thurber.

Mocking at Knowledge.

To the Editor of GARDEN AND FOREST:

Sir.—May I claim a little space in which to protest, in the interests of our young folks, against something that I find addressed to them in the pages of a magazine which we have long been accustomed to consider a source of valuable instruction? The department of *Saint Nicholas* called "Jack-in-the-Pulpit" has interested many children in the works of nature, but why should it teach that knowledge of these works destroys the enjoyment of them? In the February number of the magazine a lady who writes of a recent suggestion that it would be well to use the scientific name of *Epigæa repens* instead of the inaccurate *Arbutus*, says: "If we begin to use the scientific names, where shall we stop? The next thing will be to call the delicate Spring Beauty, *Claytonia Virginica*. . . . (By the way, the botanists seem to have had a hobby for calling things after Virginia and Carolina and Canada; when they got tired of using these they named all the rest of the plants after foreign travelers.) But there is worse yet to come. . . . The truth is that the botanists themselves sometimes have two or three names for the same plant. . . . And just think how we have been twitted with

having different common names in different parts of the country! Since I can remember, the dear little Bluets were named *Oldenlandia carulea*. Afterward they were changed back to *Houstonia carulea* by the great Mr. Gray himself. How much simpler just to call the pretty things Bluets! The truth is, my dears, that the Latin names make a herbarium look very learned; and when you collect one I hope you will take great pains to have the plants properly labeled. But what would your poets do with *Houstonia carulea* in their verses? I do not think such terms are suitable for the finer uses of life and literature; so I hope you children all will take pains to learn the common names of the flowers. I only wish you could tell me every one; but perhaps some one will yet make a dictionary of them."

Considering the brevity of this extract, does it not say or suggest a surprising number of misleading things? The reader is led to believe, for instance, that from the standpoint of agreeable sound scientific names, as a class, are greatly inferior to vernacular ones. But is Milkwort prettier than Polygala, or Woad-waxen than Genista, or Tick-trefoil than Desmodium, or False Indigo than Baptisia, or False Mitrewort than Tiarella? Which would a poet prefer to say, Sweet-gum or Liquidambar, Pepperidge or Nyssa, Fetid Marigold or Dysodia, Sneeze-weed or Helenium, Shin-leaf or Pyrola? And would he really object so much even to Claytonia or Houstonia? Of course a list pointing the other way might be made out as easily as this one could be greatly extended. I do not mean to say that all scientific names are musical, or all common ones ugly; only, that to arraign scientific names as a whole from the "æsthetic" standpoint is a foolish act as well as a useless one. It is worse, however, to imply that a hard and fast line can be drawn between the two classes of names. What would the writer call a Dahlia or an Aster or a Nasturtium, a Wistaria, a Fuchsia, a Gerardia, an Azalea or a Chrysanthemum, a Rhododendron, a Sassafras? Would she call Calypso and Arethusa each simply "an Orchid" to avoid scientific terminology—and, by the way, would she find the terminology in this case unfit for poetic or any other "fine" use? How much better it would have been, while quite as easy, to explain that no line can be drawn between the two kinds of names; to show that sometimes the scientific name is perfectly familiar and "common" and often there is no other; that sometimes there is another which is "commoner" in the sense of being English yet is much less familiar even to non-scientific ears; that sometimes there are two which differ only by the change of a letter or so (as with Orchid, Heliotrope, Lily and Gentian); and that often, of course, the vernacular name is so well known and sufficient that even a botanist would not use the scientific one in conversation or ordinary writing unless he were the worst of pedants. And if the author truly desired that the common names of plants should be known, might she not well have counseled an acquaintance with scientific terminology? Do we not all know how difficult it is to find some one to tell us the common names? But we can find them in the "botany books" if we know how to find the scientific name first. "Perhaps some one will still make a dictionary of them;" is not this just what has been done by botanists in their handbooks and what could not be done by any other method than theirs? For how is a plant to be described so its right to a name can be made clear except by means of the terms which scientific writers employ? Any one who has even the most superficial acquaintance with his "Gray's Manual" knows the common names of plants far better, I venture to say, than the most enthusiastic flower-lover who scorns everything "scientific." Of course I need hardly explain here that if a person feels enough interest in plants to wish to recognize different closely related species, then he must, in almost every case, use scientific names or none at all; nor, on the other hand, that it is not always needful to tack the specific to the generic name—that even botanists do not say *Claytonia Virginica* when Claytonia would do as well, or refuse to speak of Houstonia without adding the *carulea*. But these are just the things that ought to be explained when a magazine professes to wish to interest young readers in the works of nature. Would it not have been as interesting to point out why botanical names have been duplicated as to twist the fact as the writer does? And, instead of laughing at the constant reference to Carolina, Canada and Virginia in botanical nomenclature, would it not have been instructive to cite a few historical facts in explanation, and likewise to indicate the biographical significance of the perpetual use of the names of "foreign travelers"? In short, cannot knowledge be made as attractive to children as a "sprightly" mocking at knowledge?

A Mother.

New Haven, Conn.

Esparto Grass.

To the Editor of GARDEN AND FOREST:

Sir.—Can you tell me whether the Spanish Esparto Grass is growing anywhere in the southern States, and whether it can be successfully introduced on the alluvial lands of our southern rivers? I make this inquiry as bearing on the question of the production of a good vegetable fibre for the manufacture of paper.

Hill City, Tenn.

F. G. Hampton.

[We are informed by Dr. Vasey, of the Department of Agriculture, that numerous attempts have been made to grow the Esparto in this country, but without success up to a recent date. Two years ago considerable seed was sent out from the Department, but no reports of success with it have been received. But at Berkeley, California, in the grounds of the California Agricultural College, Dr. Vasey saw last year a long row of this Grass growing very luxuriantly, from which considerable seed had been distributed; so that it appears that the Esparto can be successfully grown in California, and there seems to be no reason why it should not succeed also in the Atlantic states.—Ed.]

Recent Publications.

Plants of Baja California, by Townsend Smith Brandegee. Reprinted from the *Proceedings of the California Academy of Science*, ser. 2, vol. ii., pp. 117, 232; illustrated with twelve plates.

Mr. Brandegee's contribution to our knowledge of the botany of Lower California is one of the most interesting papers on American plants which has recently appeared. Up to the present time very little has been known concerning the botany of the southern part of the Lower California peninsula. Her Majesty's ship "Sulphur," during her voyage of exploration, touched at Cape St. Lucas and at Magdalena Bay in 1839, and the naturalist, Mr. Hinds, made a small collection of plants at these places. Cape St. Lucas was next visited in 1860 by Mr. Zantus, who was the last botanist who visited this region until 1887, when Mr. Walter E. Bryant, the ornithologist, made a small collection of plants from the neighborhood of Magdalena Bay, and Dr. Edward Palmer visited Los Angeles Bay and Muleje. Mr. Brandegee, in the journey which he made through the peninsula last winter, had the opportunity not only to collect again the little known plants of Hinds and Zantus, but to discover several new species, which he describes in this paper.

The peninsula of Lower California, a long, narrow strip of land often not more than sixty miles wide, consists of a mountain range varying in height from two to four thousand feet, with its backbone near the gulf shore and a long gradual slope to the Pacific Ocean. The climate is much warmer on the gulf shore than it is on the Pacific side of the peninsula.

Mr. Brandegee landed in Magdalena Bay in about latitude 24, in January. In the mountains and on the sand-flats about the town of Magdalena Bay 106 species of plants were found; many of these were seen nowhere else, except on the neighboring island of Santa Margarita. No trees grow on these islands with the exception of *Veatchia*, the Elephant-tree, certainly one of the most curious and remarkable of American trees, first detected in this region by Mr. Hinds, but best known by Dr. John A. Veatch's description of the trees, which much later he detected on Cerros Island. *Veatchia* is related to *Rhus*, from which it differs principally in its valvate sepals, accrescent petals, and thin-walled fruit. The flowers, which quite cover the leafless branches during the winter months, are either bright pink or yellowish gray, Mr. Brandegee noticing the different colors on different trees. *Veatchia* is diœcious, but the color of the flowers bears, apparently, no relation to sex. The Elephant-tree attains, sometimes, on the mainland, a height of ten to twenty-five feet, with a trunk one to two feet in diameter. It has low, tortuous, widely-spreading branches, and fascicled leaves one to three inches long, with sessile leaflets, and axillary or more or less large, terminal panicles of minute flowers. It is known locally in Lower California as "Copalquien," and the bark, as is the case with many species of *Rhus*, is used in tanning leather. The ripe fruit has not yet been collected. According to Dr. Veatch, for whom Dr. Gray named the genus, separating it from *Rhus* (the plant was first referred by Bentham to *Schinus*, in his description of the plants collected by Mr.

Hinds on the "Sulphur" voyage), "it derives its name from the elephantine proportions of its sturdy, heavy-looking trunk and branches. The main trunk of a full grown tree will probably average two feet in diameter, the height being a little more and often less than the diameter. The trunk divides into several ponderous branches that shoot off horizontally, and are bent and contracted in grotesque resemblance of the reflexed limbs of a corpulent human being. These huge branches often terminate suddenly in a few short twigs covered with a profusion of red flowers, reminding one of the proboscis of an elephant holding a nosegay. The resemblance is heightened by the peculiar brown, skin-like epidermis that forms the outer bark, which splits and peels off annually, accommodating the increase of growth. The branches of the larger trees often shoot out to a horizontal distance of twenty feet from the trunk, thus covering an area of forty feet in diameter. Smaller subordinate limbs spring upward from the upper side of the large boughs, and in this way give a neat oval appearance to the outline of the tree. When loaded with its bright red flowers the effect is strikingly beautiful, particularly where hundreds of the trees stand near each other, intertwining their huge boughs and forbidding ingress to the mysterious space they cover and protect. The young tree looks a good deal like a huge radish protruding from the ground with but a slight root and a few twig-like branches expanding from the top."

Mr. Brandegee, from Magdalena, went up the lagoon to San Gregoria, where a number of new plants were found. One of the most interesting, perhaps, is the new *Ipomœa*, first detected on Magdalena Island, and for which the name of *I. Ficama* is proposed. It is a woody species climbing about over shrubs and producing large white flowers. The chief interest of this plant, however, is found in its roots, which "bear tubers that are much sought for on account of their fine flavor and watery juice. One weighing six pounds is said to have been found, and traditions of a ten-pounder are extant; but the largest seen weighed two or three pounds and they are usually much smaller. These tubers must grow very fast during the rainy and spring season, for their location, often three feet or more from the base of the stems, is discovered by the growth cracking the soil. New stems never spring from them and their use to the parent plant is uncertain; perhaps it is to store up moisture to be drawn during the dry season. These round tubers or "Jicamas" are always eaten raw and resemble in taste a turnip somewhat sweetened. Wherever the plant grows, near plantations or along trails, numerous little hollows may be seen around the plants at distances varying from two to four feet, showing the places from which the tubers have been dug."

From San Gregoria our traveler proceeded to Comondu, where two weeks were given to a careful exploration of the flora, and then, with a pack train and guides, was begun the principal journey, which carried the party through the centre of the peninsula for a distance of nearly five hundred miles, over a dry, desolate, rocky and almost uninhabited region, finally landing them, at the end of a weary march of two months, at San Quintin, two degrees south of San Diego. A fine new *Agave*, for which Mr. Brandegee proposes the name of *A. sobria*, was the most conspicuous plant on the high *mesas* about Comondu. It is described as ten feet high, with thick radical leaves and a panicle of five hundred dark yellow flowers. After leaving Comondu no great change was observed in the flora for several days. *Rhus laurina*, a common tree or shrub covering large areas in southern California and in the northern part of the peninsula, was first seen near San Jose de Gracia, no doubt at the southern limit of its distribution; and near here were several large forests of *Cereus Pringlei* (see GARDEN AND FOREST, ii., 6). For a new arborescent *Yucca* Mr. Brandegee proposes the name of *Yucca valeda*. It attains the height of fifteen or twenty feet, with trunks eight inches to two feet or more in diameter, growing in clumps and branching from the base. The leaves are thin, smooth, flexible, six to nine inches long and only a half to three-quarters of an inch wide, the margins dividing into slender white threads. The panicle of flowers is very short, only about a foot long and somewhat pubescent. The flowers are creamy white, two to two and a half inches broad, on peduncles nearly as long as the segments of the perianth, which are broadly lanceolate. A photograph (plate xi.) represents a wide-spreading specimen of this interesting plant, which, near Patrocinia, forms forests miles in extent; the trees, Mr. Brandegee remarks, being in general appearance strikingly like those of *Y. brevifolia* of the Mohave Desert, though the trunks are less covered with the old reflexed leaves. The old Catholic Mission at San Ignacio, embalmed in a forest of Date Palms, seemed

like an oasis in the desert. At San Julio, a cañon eight hundred feet deep, with walls apparently perpendicular, was explored, and here was found, no doubt at its southern limit, the Holly Cherry of California (*Prunus ilicifolia*), with the entire leaves which characterize the form peculiar to Santa Cruz Island. Veatchia re-appeared at San Pabalo on the mountains, and afterwards was often encountered as far north as San Fernando. "The trail from San Ignacio passed," Mr. Brandegee tells us, "over high mesas, down and up deep rocky cañons all the way to San Pablo and mostly over sandy plains from there to Calmulli. A great change in vegetation took place in this vicinity, and many of the characteristic plants at the south, that were abundant on the sandy plains about Cañon Grande, have now disappeared, and thenceforward, until we reached the Gulf coast at the Soda Springs of Calamujuet, the flora resembled that so familiar to us in southern California." Such Arizona trees as *Dalea spinosa*, *Olneya Tesota*, *Chilopsis saligna*, form a large part of the vegetation at Calamujuet, although Veatchia was still the most conspicuous object; "the trees, covered with pink blossoms, forming a perfect blaze of color which could be seen plainly miles away." "Annuals, both at Magdalena Bay and San Gregoria, bloom in January and February, and by April have for the most part disappeared. Many shrubs ripen their fruit in January, although many species of Cactus and some perennials do not flower until April or May. The most noticeable feature of the flora over the whole region visited by Mr. Brandegee is the *Cactaceæ*, which often form forests and impassable thickets, and brighten the landscape in May with their showy flowers. Agaves are common and cover the ground in some localities. Leguminous trees are, on the whole, the most common and furnish most of the wood used by the inhabitants. The bruised stems of *Cereus gumosus* are used for stupefying fish. The leaves of *Lippia barbata*, a shrubby species, are employed in cooking to flavor meat, while those of another shrubby species, *L. fastigiata*, under the name of "Damania," are made into a sort of tea.

Among other interesting plants detected by Mr. Brandegee are *Polygala apopetala* (plate iii.), a shrubby species; a new *Horsfordia*, a new *Spæralcea*, with slender, herbaceous stems, eight feet high, and a new *Gossypium*, which Mr. Brandegee dedicates to Dr. H. W. Harkness, President of the California Academy of Science, "as a tribute to his efforts in furthering the exploration of Lower California;" a new *Bursera*, several *Daleas* and *Hosackias*, an arborescent *Lysiloma*, whose bark is used for tanning hides used to hold the wine of the country, which thus receives a disagreeable flavor from the bark of this tree. Several new *Cereus* and *Opuntias*, and an interesting *Aralia* (*A. Scopulorum*, plate viii.), a shrubby species, four to ten feet high, with petioled leaves, with three to seven leaflets, and compound inflorescence, are described. A new genus, *Alvordia*, in *Compositæ*, in honor of William Alvord, the President of the Bank of California, "in recognition of his well known unceasing interest in and efforts for the furtherance of botanical knowledge," is proposed for a suffrutescent perennial. *Gilia gloriosa* (plate xi.) is a shrubby species, densely branched, and forming round clumps, three or four feet high, about which Mr. Brandegee remarks that "it will be difficult to exaggerate its beauty as it is seen growing in rounded masses, with the many-shaded large blossoms crowded toward the end of the branches." Unfortunately, no seed could be obtained of this plant, which appears to be very local, having been observed only at one place—Ubi.

To Mr. Brandegee's paper is appended an account of his plants of the *Euphorbia* family, from the pen of Dr. C. F. Millsbaugh, and a list of fungi, by H. W. Harkness.

Recent Plant Portraits.

MONTBRETIA CROCOSMÆFLORA, *Revue Horticole*, January 16th; a group of some of the newer varieties, obtained by M. Lemoine, of Nancy.

SOLANUM MACRANTHUM, *Gardeners' Chronicle*, January 18th; Mr. W. Botting Hemsley throws considerable new light upon this fine species, at one time supposed to be a native of southern China, but now shown to be identical with a specimen collected by Mr. Pearce on the Amatala River, at an elevation of from four thousand to five thousand feet, in Bolivia. *Solanum macranthum* becomes a tree fifteen to twenty feet high, called, at Hong-Kong, where it appears to have been long cultivated and where it flowers throughout the year, the Potato-tree. Carrière pointed out, some time ago, that it was cultivated at Cairo, where it succeeds admirably and forms an ornamental tree of the first order. In France it is used in so-called sub-tropical gardening—that is, young

plants started under glass in winter are planted in the open ground at the beginning of summer, and attain, under good cultivation, a considerable size before frost. It is one of the species with large, lobed leaves, with scattered prickles, and it has great clusters of flowers, each three inches in diameter, and varying in color from white to an intense violet-blue, with large, bright yellow anthers. *S. macranthum* may be expected to succeed in some parts of California and possibly in the southern Atlantic States.

DARLINGTONIA CALIFORNICA, *Gardeners' Chronicle*, January 18th; the portrait of a beautifully grown plant from the Mount Merion gardens near Dublin, the largest pitcher measuring three feet nine inches in length. This is probably one of the very best specimens of a peculiar plant, difficult to manage in cultivation, which has been produced.

LÆLIA GOULDIANA, *Gardeners' Chronicle*, February 8th, a figure of this handsome winter-blooming species, from a plant which produced ten spikes and over forty of its bright rosy crimson flowers at Christmas-time in Sir Trevor Lawrence's garden. *Lælia Gouldiana* was an introduction of Messrs. Siebrecht & Wadley, of this city, and was named for Mr. Jay Gould.

Exhibitions.

Orchids at the Eden Musée.

THE fourth annual exhibition of Orchids, which is now in progress under the direction of Messrs. Siebrecht & Wadley, has been more numerously attended than any of its predecessors; indeed, the throngs on some days have been so dense that an inspection of the flowers was almost impossible. And the visitors found much that was worthy of study and admiration. As usual, the larger portion of the plants came from the Rose Hill Nurseries, but the contributions from the collections of Mrs. F. Goodrich, of Mr. W. S. Kimball, of Mr. J. Eyerman, of Easton, Pennsylvania, and Mr. Frederick Mau added greatly to the value and interest of the display. Indeed, the group of hybrid *Cypripediums* which Mr. Kimball sent on from Rochester and which nestled modestly among the Ferns on a little circular table in the centre of the room, was to many connoisseurs the most attractive part of the show. Here was *C. Winnianum* between its parent plants, *C. Druryi* and *C. villosum*. Near these was the delicate *C. Measuresianum*, with *C. euryandrum majus*, *C. Argus*, Kimball's variety, *C. calophyllum striatum* and many more which are only found where the most rare and costly *Cypripediums* are collected. Another group of cut flowers sent by Mr. Kimball included such fine varieties as *Cattleya Trianae Backhousiana*, the exceedingly rare *Cattleya amethystoglossa alba*, *Dendrobium nobile elegans*, *D. oculatum fimbriatum*, two long spikes of *Odontoglossum Coradinei pallidum*, *Zygopetalum rostratum*, the bright orange-scarlet *Ada aurantiaca*, the curious terrestrial Orchid, *Stenorhynchus speciosus*, with its coral-red spike and beautifully spotted foliage, the bright red *Epidendrum radicans*, spikes of *Schomburgkia undulata*, and many more of almost equal interest.

On the side of the hall beyond Mr. Kimball's flowers were twenty-five plants of *Cattleya Trianae* exhibited by Mr. Frederick Mau, of Weehawken, New Jersey, which deserve special mention. Of course, the *Cattleyas* of this species were more abundant than any others, but Mr. Mau's plants had been selected as the choice of thousands, and in richness of color and firmness of texture they made a striking group. An unnamed and distinct *Odontoglossum*, in the way of *O. cristatellum*, was another noteworthy plant in this collection.

Mrs. Goodrich and Mr. John Eyerman contributed many fine flowers, among them the best example of the white flowered *Cattleya Trianae*, and a beautifully colored *C. Bogotensis*, a flower rarely seen. The gem of the collection of Mr. De Forest, of Summit, New Jersey, was an immense plant of *C. Trianae alba*, two feet in diameter.

The tables in the body of the room were usually arranged with large Palms rising from their centres, with the Orchids grouped about them in masses of *Adiantum cuneatum* and *A. Farleyense*. A superb *Seaforthia elegans* towered above Mr. Kimball's *Cypripediums*, a tall *Chamærops* graced another table, a *Rhapis* rose from a third, and in the anteroom was a magnificent *Encephalartos*, twelve feet through. All these were furnished by Messrs. Siebrecht & Wadley, as were the other plants used for general decoration. *Ericas* were abundantly used, and the stage was particularly attractive, surrounded by a double row of Heaths and Azaleas, behind a line of *Adiantums* and an edging of *Lycopodium*.

Among the Orchids from the Rose Hill collection were masses of finely grown *Phalaenopsis*, many *Oncidiums*, including several good specimens of *O. Papilio*, a striking

group of the bold, rich colored *Cattleya Percivalliana*, Odonoglossums by the score, including a good example of *O. Ræzii album*, well grown specimens of *Vanda suavis*, *Miltonia vexillaria*, *Cattleya intermedia superba* and many more. A unique *Cypripedium* is attracting much attention. It resembles *C. calurum*, but is much darker—a deep purplish red. The origin of the plant has not been made known.

The exhibition will remain open all the week.

Notes.

In former years the prices of cut flowers have invariably fallen from thirty to fifty per cent. on the arrival of Lent, but this year there has been no decline whatever in prices in this city.

Among the floral designs at the funeral of Her Majesty the Empress Augusta was a cross five feet long and more than two feet wide, made of White Lilacs, White Camellias, Lilies-of-the-Valley and *Cypripedium Spectabile*.

Nature announces the death, at Malta, of Dr. Gulia, Professor of Botany, Hygiene and Forensic Medicine in the University of Valletta. Dr. Gulia is known by his "Flora of Malta," an enlarged edition of which he left unprinted, and which is to be brought out by his son.

Mr. F. H. Horsford, of Charlotte, Vermont, and Mr. Edward Gillett, of Southwick, Massachusetts, have combined their nurseries of wild flowers and hardy herbaceous plants, at the latter place, where, under the firm name of Gillett & Horsford, their united business will be conducted hereafter.

In Leicestershire, England, a lawyer recently brought suit against a farmer, complaining that the latter allowed Thistles to grow in a certain field to such an extent that the plaintiff's garden, some 300 yards away, was seriously injured by their seeds. Damages were awarded to the amount of three guineas.

We read in the recent issue of *Science* that the result of the Prang canvass for a popular expression with regard to the national flower gives seventy per cent. of all the votes for the Golden-rod, sixteen per cent. for the Mayflower, and fourteen per cent. divided among the Daisy, the Mountain Laurel, Dandelion, Sunflower and various other plants.

According to Dr. Draper's calculations, the weather in this vicinity has been more abnormal this season than for seventy years past. The high temperature of November, of December or of January had been matched or overmatched during these seventy years, but taken together their average temperature was higher than that of any corresponding three.

Between the 21st of last October and the 7th of January George Klehm, of Arlington Heights, Chicago, cut 20,700 Violets in a greenhouse, devoted to this flower, which measures 125 feet by ten. H. Dale, of Brampton, Ontario, writes to the *American Florist* that between November 1st and January 17th he picked 10,550 Violets from a bench 100 feet long and only four feet wide.

Mr. Vogel, a timber-land explorer, recently returned from north-western Manitoba, reports, in one of the "limits" looked over by him, "150,000,000 feet of White Spruce (*Picea alba*) log-timber killed by fire during the past season. This fire not only killed the trees, but burned the bark and most of the branches from the trunks, and about a foot of the moss and vegetable deposits from the surface of the ground."

Our London correspondent called attention to the fact that difficulty had been experienced in England in the cultivation of the handsome Bornean Pitcher-plant, *Nepenthes Rajah*, and that it was not successfully managed until it was removed from the hot-house to one with a lower temperature. It is worth recording that this plant is and has been flourishing for several years in the stove-house in Mr. F. L. Ames' garden, where it is grown with a general collection of hot-house plants, including a large number of *Nepenthes*, and where it forms pitchers freely, and is just now passing out of flower. No trouble has ever been found in managing the plant, whose living pitchers Mr. Court, an expert in the cultivation of *Nepenthes* saw at North Easton for the first time.

The January issue of the *Illustrirte Gartenzeitung*, of Vienna, names 108 "new roses for 1890." Seventy-three of them come from France and only five from this country—Rosalie and Marshall P. Wilder are credited to Messrs. Ellwanger & Barry, Dinsmore to Mr. Henderson, and The Queen and White Pearl simply to America. But on another page very high praise is given to Rainbow, a sport from Papa Gontier, introduced by Mr. J. H. Sievers, of San Francisco, which is called "the newest Rose." In the same number facts are cited with

reference to the enormous Rose-growing establishment of the Messrs. Strauss in Washington, and are contrasted with the statement that when at a recent ball in Vienna it was decided to make extensive use of fine Roses, the city itself could supply but a very few, and Paris, Nice and Cannes had to be laid under contribution.

Mention was made in our last issue of a hybrid Rose raised at the Arnold Arboretum by crossing the Japanese *Rosa multiflora* with pollen of General Jacqueminot. Another of the seedlings produced by this cross has now flowered, and proves to be quite distinct from the plant which flowered first. The second seedling resembles its Japanese parent in foliage, and in its long, stout stems with rather remote, stout, hooked spines. The flowers are produced in clusters like those of *R. multiflora*. They are, however, semi-double, bright pink, and fragrant, although rather less so than the flowers produced on the first plant. These seedlings seem to show that Mr. Dawson has hit upon the right means to secure a race of hardy polyantha Roses with bright colored fragrant flowers.

A writer in a French periodical gives a curious account of the introduction of *Nicotiana colossea*, a relative of the Tobacco-plant of commerce, which was one of the finest ornamental plants shown at the recent Paris Exhibition. Several years ago he sold some Brazilian Orchids to a lady, whose gardener took the trouble to plant the trimmings and dust, as well as the Orchids themselves, in the greenhouse. A number of seeds germinated, and certain promising young seedlings, transplanted to the open air, proved to be *Nicotiana colossea*. Its leaves measure forty inches in length by twenty-two in breadth, are purplish and erect when young, but afterward a dark, shining green and spreading. The plant grows to be ten feet or more in height in the open air, where, in France, it has not bloomed. It is an annual in this situation, but a perennial in the greenhouse.

An idea of the wealth of the city of Paris in works of sculpture may be gathered from the fact that sixty-four figures and groups decorate the Tuilleries gardens, while the Luxembourg gardens contain sixty-seven, in addition to a number of decorative statues by unknown artists, which were brought from the park at Sceaux, and to the colossal fountain in the Avenue de l'Observatoire, for which Fremiet and Carpeaux supplied the figures. Almost all these works are originals by French sculptors, although some are fine copies from the antique. Even in the little Parc Monceau there are seven excellent statues, chief among them the "Sower" of Chapu, and the "Harvester" of Gaudet. As a rule, the placing of the statues has been as judicious as their selection, although occasionally they stand in the middle of a large lawn, where they can be well seen from one point of view only, and where they injure the breadth and repose of the lawn itself.

In "Humboldt" for December, 1889, is an interesting statement of the amounts expended by the Prussian State Forestry Commission to control the ravages of forest insects only. In 1884-85 were spent 200,550 marks; in 1885-86 were spent 171,404 marks; in 1886-87 were spent 191,645 marks. Of these sums the control of *Hylobius abietis* alone took from 107,200 to 109,300 marks. In commenting on these facts, *Entomologica Americana* remarks that the sums are suggestive, and yet the amount was absolutely necessary for the prevention of serious damage. Even with these sums, and the trained officials to apply them, the success in lessening the ravages was not satisfactory. It was not possible to do more than keep the pests in check. The destruction of the Cockchafer in the larval state is also still in the experimental stage, and the results are not satisfactory. The complaints in other parts of the empire of damage by white grubs are even greater than they are in Prussia, and some practical remedy would be a boon of inestimable value.

Catalogues Received.

CHARLES A. MCBRIDE, 64½ West Bay Street, Jacksonville, Fla.; Fruit and Ornamental Trees, Shrubs, Roses, etc.—JOHN R. & A. MURDOCH, 508 Smithfield Street, Pittsburgh, Pa.; Vegetable and Flower Seeds, Plants, etc.—PITCHER & MANDA, United States Nurseries, Short Hills, N. J.; Hardy Perennials, Aquatics, Alpines, Orchids, Ferns and Small Shrubs, Chrysanthemums, etc.—RUMSEY & Co., Ltd., Seneca Falls, N. Y.; Spraying Pumps.—T. H. SPAULDING, Orange, N. J.; Chrysanthemums.—E. W. REID, Bridgeport, O.; Small Fruits, Fruit Trees, Seeds, etc.—FRED. ROEMER, Quedlinburg, Germany; Flower and Vegetable Seeds, etc.—E. D. STURTEVANT, Bordentown, N. J., and Los Angeles, Cal.; Rare Water Lilies and other Aquatic Plants.—THE STORRS & HARRISON Co., Painesville, O.; Seeds, Plants, Trees, Small Fruits, etc.—SAMUEL WILSON, Mechanicsville, Bucks County, Pa.; Garden, Flower and Vegetable Seeds.

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Wasted Effort in Forest-Reform.

IN a letter which will be found on another page of this issue, Mr. Binney states that much effort toward forest-reform has been wasted. By this he means that if the desultory, volunteer work of all persons who have attempted in their own individual way to put some check upon the useless destruction of forests had been organized and concentrated, much more would have been accomplished than has been gained up to the present time. It is true also that organization not only makes work effective, but what is of still greater importance, it offers opportunity for work to many willing persons who otherwise could find nothing to do. At the present time there are several bills before Congress, each of which is honestly intended to protect and preserve the forests on the public domain. Senator Sherman, for example, has offered one which calls for a commission, consisting of the Chief Engineer of the Army, the Chief Signal Officer, the Secretary of Agriculture and the Secretary of the Smithsonian Institute, to assume a certain control over the public forests, and Senator Hale has introduced another measure similar to the one advocated two years ago by the Forestry Congress. Mr. Dunnell has charge of a third, of which we have before spoken. There is little doubt that if the authors of all these bills and the forces which are behind them should unite upon some common policy, the chances of success would be much greater than are the chances for either measure now.

The efforts of the men who show an interest in the Adirondack forests are even more divided and scattering. The Forest Commission has certain bills of its own to pass. The Governor writes a special message recommending a State Park, which project is condemned by the committee to whom it is referred. The Speaker of the House presents another bill for an Adirondack Park, and certain physicians of this city have organized still another scheme for a sanitarium, which they propose to push forward without regard to any other interests. Unfortunately there is a suspicion that more than one of these schemes is only patriotic on its face, and the appearance of public spirit is only a disguise to conceal selfish purposes. It is rumored that behind one large park scheme stands a great iron-master, who has stripped the timber from thousands of acres, and now that

the land is no longer useful for his purpose, he is eager to sell it to the state. Another Adirondack Park scheme is conceived, according to the statement of one of its projectors, primarily for the diversion of a few, and not for the health and happiness of the many. There can be no question that if there was an active association of all the men in the state who have an intelligent and unselfish interest in preserving what is left of the North Woods—an association with means to employ salaried agents to devote their time to these questions and give the proper direction to public opinion—the future of the Adirondacks would be more hopeful. As the case now is, reputable newspapers have been betrayed into advocating measures which mean ruin for the forest and robbery for the state. If sagacious men were paid to look after the interests of the forests, in Albany and elsewhere, just as other interests are cared for by trusts and business unions of one sort or another, persons who really desire to protect the forests could be warned, at least, against advocating measures which have been framed to defeat the very object which they pretend to promote.

Now, it is very true that we have no guarantee that forest associations will act wisely. They may fall under injudicious management; they may try to accomplish impossibilities or to secure even pernicious legislation. But, after all, they must be judged as other human agencies are judged, and if wise men are dissatisfied with their administration the true remedy is to secure a better executive force. Certain it is that the approved modern way of carrying on any reform is through men who are employed to devote themselves to the business systematically and exclusively; to use all legitimate means of instruction and influence through the press, and at the Capitol; to watch over the forests, if forest-reform is their object, with an interest as vigilant, at least, as that which is exercised by those who are organizing plans for their destruction. It is true that a half dozen wealthy men might unite to employ such agents; but the natural way, even for such men, is to work through larger associations, adding their liberal contributions to the mites of those who can afford to give no more.

The state organizations are doing much indispensable work, but we wish especially to state here our belief that the National Forestry Association is worthy of the confidence and support of those who are concerned about the forests of the country. It has a definite object in view, which is to secure the appointment of a properly equipped Commission to examine the government forests and report the best method to preserve and utilize them, insisting, meanwhile, that all forest-land shall be withdrawn from sale and entry until such method is adopted. This object ought to commend itself to all thoughtful Americans, and therefore, in our opinion, a large increase in the membership of the Association is in every way desirable, both as a means for raising funds and for the influence which comes from the power of numbers. Aid extended to this Association will not be effort wasted.

Mr. Charles Eliot suggests in another column the formation of associations for the purpose of holding and protecting for the public benefit pieces of ground like that covered by the Waverly Oaks; of special beauty or of special interest. Such an association, as we pointed out last year, exists already in the town of Cassanovia, in this state, and the beautiful falls of the Chittenango are preserved by its efforts in all their wild picturesqueness. Spots of unusual natural beauty, or of real historical interest, may still be found near many of our cities, and there can be no doubt that such places should be preserved for the people who seem destined, in ever increasing numbers, to throng American cities. The work of securing these bits of scenery, as well as open spaces or play-grounds in what is still the country, but which sooner or later will be covered over with bricks and mortar, cannot be undertaken too soon or pushed too energetically. Such pieces of ground can often be secured now with a comparatively small outlay in money, and the necessary authority for holding

them can doubtless be obtained from other state governments as it has from that of this state. Contributions of money would flow into the treasury of such an association as soon as people became convinced that it was managed judiciously and for the best interests of the public, and the only real difficulty in carrying out Mr. Eliot's excellent suggestion will be found in securing persons of the necessary attainments for such work with the leisure requisite for the organization and management of such a trust. Good men and women for such work are difficult to find always, and the most fitting have generally their hands more than full with public and private duties.

We have occasionally suggested that perhaps the projectors of immense storage reservoirs for purposes of irrigation neglected to take into account the danger which threatened life and property from these great volumes of imprisoned water. The reply to these cautions has always been that the problem was a simple one to engineers who understood the physical conditions in the arid regions, and that American skill could be trusted with the construction of the needed dams, which could be made absolutely safe. The bursting of the great Walnut Grove reservoir in Arizona, however, seems to justify all the warnings that have been sounded. This work has been spoken of as a masterpiece of engineering skill. It has been illustrated in the press as one of the wonders of the country, and was pronounced perfectly able to withstand any possible pressure from floods. And yet it gave way at the very first serious onset of the waters. The horrors of Johnstown were not repeated simply because there were not so many people in the track of the torrent. It is a misfortune that Major Powell is less zealous to protect the natural reservoirs furnished by the mountain forests than he is to construct artificial ones, which certainly are less safe, and which may be less effective than he imagines.

The Art of Gardening—An Historical Sketch.

XVIII.—The Mahometans in Persia.

HAVING glanced at India as it was before the advent of its Mahometan conquerors, we may now turn back to Persia, where these conquerors were to learn their skill in the art of gardening. Persia is exceptionally interesting to the student of history in any of its branches because it has so often refreshed its power under the rule of a new dynasty or a new race. From the time of Cyrus to our own, whatever the name and the faith of its rulers, the individuality of Persia has never been wiped out, and national tastes have persisted and have influenced both the East and the West. In the sixth century of our era not even Justinian's capital on the Bosphorus was more splendid than Ctesiphon, the capital of the Sassanid sovereigns of Persia, and their love for pleasure-grounds is embalmed in anecdotes that are repeated in every school history. Poetical and religious writings still more clearly reflect the national passion for gardens. St. John pictures a purely architectural paradise as the home of the Christian blessed. But the seventh heaven reserved for the followers of Zoroaster, as described by writers of the Sassanid period, was to be a garden with paths of polished gold, filled with flowers and fruits and odors and with pleasure-houses of diamond and pearl; and one special spot is described at length. Here, in white and golden robes, on thrones of gold and silver, will sit the geni of water, of fire and of plants, and with them the souls of "governors and officials, who have not failed in good works, who have dug fountains and canals, built aqueducts, established inns and resting-places for weary wanderers, laid out gardens for the pleasure of the poor, and not impiously hewn down trees and plants; who have guarded the sacred fire and followed the religion of Zoroaster."*

Into the luxurious and intellectual land of Persia broke the rude, conquering, proselytizing Arab shortly after the death of Mahomet in the seventh century. Here, for the first time, he came in contact with a highly developed civilization. Here he quickly absorbed its lessons, and, gradually amalgamating with the native Persian, developed the arts and sciences which he found in bud; and hence all he had learned

was carried westward over half the ancient empire of Rome and eastward much farther than the Roman had ever gone.

There was no united kingdom of Persia for centuries after the first Mahometan inroad. But this fact only served to increase the splendor of the land at large, each district having its lordly ruler and flourishing under his lavish hand.† When we speak of Bagdad in the time of Haroun-al-Raschid, when we read of it in the "Arabian Nights" or the poems of Persian singers, we think of a city of gardens, shadowy with Cypress, Poplar and Plane, plashing with innumerable fountains and rivulets, sweet with a thousand odors, brilliant with a myriad flowers by day and a million twinkling lamps by night. Bagdad without its gardens, or Damascus, or Shiraz, or Ispahan, would be like Rome without its hills, like Venice without its waves.

The western Asiatic, with his strong feeling for architectural beauty, never made the mistake of surrounding stately buildings with grounds of a purely "natural" character. His urban gardens, as we can be sure even from the fanciful descriptions in the "Arabian Nights," and as will be shown when we speak of the gardens of the Arabs in Europe, were formal in arrangement, with marble walks and benches, regular avenues, and a multitude of fountains and pavilions. Shade and coolness were the things he cared for most, and the odor of flowers was as much prized as their beauty. But the semi-poetic, semi-fantastic cast of the west Asiatic mind leads it to appreciate picturesqueness and variety as well as symmetry; and whenever it has been inspired by romantic landscape forms, it has reproduced their charm in appropriate situations. A mediæval writer, Abu Ishak Ibrahim, called El Istachri, in his "Book of the Roads of the Countries" (which treats of the whole of Islam, but especially of Persia), tells of five thousand country-houses or "castles," some standing in the neighborhood of towns, but some deep in the mountains. Half a dozen centuries make as little change, very often, in the tastes and customs of oriental as does half a century in those of occidental nations. Modern Persia is but the degenerate child of mediæval Persia; and thus, when later on we shall read of the aspect of the Persian country home of to-day, we shall realize that in mediæval years a romantic wildness, carefully simulated by art, distinguished its grounds when the natural character of the landscape permitted.

The planting of shade-trees along streets and highways was sedulously practiced in mediæval Persia. Teheran was called "the city of Planes," from its embowered streets, and the Plane was everywhere the favorite tree for such purposes.‡

What we call Saracenic architecture was born under the Mahometan rulers of Persia, and was based on ancient Persian elements. So, too, was the gardening art that accompanied it as it spread to the Atlantic and the Ganges. There were no such masters of the art of gardening as the Mahometan shahs and khalifs during the whole thousand years which divided the eclipse of classic architecture from its renaissance in modern Italy. While Gothic architecture was so splendidly developing in the north, gardening art, as we have seen, scarcely there deserved the name. But the two arts flourished hand and hand in the Mahometan south, and, indeed, the work of the mediæval Mahometan gardener has, in some respects, never been surpassed. Is it not interesting to know that in this case, as in the case of ancient Athens and Rome, the first impulse, the first teaching, came from Persia?§

All along the north coast of Africa and over many of the southern shores of Europe the Mahometan conquerors gradually spread, at first destroying like very Goths, but soon repairing the relics of ancient beauty which they found, or creating new beauty on newly chosen sites. In the fourth century, as has been told, Belisarius found the Vandals luxuriating in a thousand villas and gardens in those parts of Africa where at first the Phœnician settlers and then the

† Jaeger, in his "Gartenkunst und Gaerten," compares the influence upon national culture exerted by these local capitals to that exerted by the many small courts of Germany during the seventeenth and eighteenth centuries. But it should be remembered that in the middle ages there were no other countries where science and art were similarly fostered. "Their splendid palaces," says Hallam, "History of the Middle Ages," of the khalifs of Bagdad, "their numerous guards, their treasures of gold and silver, the populousness and wealth of their cities, formed a striking contrast to the rudeness and poverty of the western nations in the same age. In their court, learning, which the first Moslems had despised as unwelcome, or rejected as profane, was held in honor."

‡ Benjamin: "Persia and the Persians." Colonel Yule, in the notes to his edition of Marco Polo's "Travels," gives an interesting account of some famous Plane-trees in Persia: and the Venetian adventurer's own story of the "Old Man of the Mountain" and his "paradise" well illustrates the national delight in gardens.

§ The inborn oriental love for gardens shows, of course, in Mahomet's own descriptions of paradise; but, although the imagination of the Arab had been fired by the achievements of others, his artistic instincts found but slight chance to express themselves until he came under Persian influence.

* Justi, "Geschichte des alten Persiens."

colonists of Rome had luxuriated before them. Here in the eighth century the new race of garden-lovers found the relics of many pleasure-grounds and utilized for their rehabilitation the huge aqueducts and tanks that had been built by Phœnician and patched by Roman hands—works that even to-day exist, although now amid wholly desert surroundings.

On the little island of Mascali, off the coast of Catania, lay a Saracenic garden often visited by the Crusaders, and described with the enthusiasm of men fresh from the rude, inhospitable north. The garden called "Zisa," which the Saracens laid out near Palermo, in Sicily, excited admiration even in the sixteenth century. It had a great central building with colonnades and pavilions surrounding a marble basin; another larger piece of water encircling a kiosk with a gilt cupola and rich stucco and mosaic decorations; and walks canopied with trellises leading to a park two miles in circumference, which was probably a preserve for curious animals. The garden of the "Moorish palace" of Navello, near Salerno, still shows remains of terraces and plantations which "delight the eye of the connoisseur." ||

New York City.

M. G. Van Rensselaer.

Holiday Notes in Southern France and Northern Italy.—XII.

ANTIBES, the Antipolis of the ancient Greeks, is a small, lively seaport of about 6,000 inhabitants, beautifully situated on a promontory commanding magnificent views of the Mediterranean and the Alpes Maritimes. The only relics of antiquity it can now boast are a couple of towers; these, however, as well as the strong fortifications built by Vauban, we pass over without remark, for the real object of our pilgrimage to Antibes was to visit the famous gardens of the Villa Thuret, so ably managed by M. Naudin. After the death of M. Thuret, the late proprietor, the gardens became the property of the French nation, and they are now used for experiments in the open-air cultivation of tropical and sub-tropical plants. M. Naudin has made a special study of the species of Eucalyptus which are now grown in such large numbers in the Mediterranean region, and, as far as Europe is concerned, he is the authority for this large, difficult and very variable genus.

The Villa itself is clothed with such creepers as Bougainvillea, Tecoma and other showy plants which in England we have to cultivate in a warm house; behind it is a fine grove of Stone Pines. An entire number of GARDEN AND FOREST would not more than provide space for a catalogue of all the remarkable plants at Antibes, and but a very small proportion can therefore be enumerated now. Palms are well represented by remarkably fine examples. The finest specimen of *Fubaa spectabilis* we had ever seen has a huge trunk about two yards through at the base. *Sabal Blackburniana*—of which there is a grand plant in the Palm-stove at Kew—is here in excellent health, as is also *S. Havanensis* and some other species. *Livistona australis* and *Cocos australis*, the latter bearing a plentiful crop of fruit, are also especially worthy of mention.

Erigeron mucronatum—or, as it used to be called in English gardens, *Vittadenia trilobata*—made a very neat and pretty border along some of the walks. In sunny open spots Mesembryanthemums were very effectively used in a similar way, among them the large yellow-flowered *M. edule*—the Hot-tentot Fig of the Cape of Good Hope.

Many remarkable conifers are to be seen at Antibes. Here for the first time we had the pleasure of meeting with the Chinese Weeping Cypress, *Cupressus funebris*, in its adult condition, exactly similar in appearance to the species as figured by Fortune in his "Travels." In Britain—at any rate, in the neighborhood of London—this interesting plant, though growing freely enough for a time, gets injured badly by frost or killed outright every ten or a dozen years. Side by side with the Cedar of Lebanon, the Deodar, *Abies Pinsapo*, etc., which thrive so well with us, such sub-tropical species as *Pinus Canariensis*—here a large, handsome tree with rich red bark, the Mexican Cypress, *C. Benthamiana*—a fine tree with spray of the richest green, *C. pendula glauca*—a species with very glaucous leaves, said to be of Indian origin, the Bunya-Bunya Pine of Queensland—*Araucaria Bidwilli*—were noted in luxuriant health and beauty. *Abies Cilicica*, too, which can hardly be made to exist in the open at Kew, is, at Antibes, a handsome pyramidal tree.

Succulents are largely grown, and all the species previously mentioned in former chapters of my holiday notes, together with many others, are to be seen in the Jardin Thuret. Bes-

||Jaeger: "Gartenkunst und Gaerten."

chorneria yuccoides—or, at any rate, a plant so named; for it differs from the Kew specimens in being distinctly filamentose—has a stem seven or eight feet in height, surmounted by a crown of huge leaves. One of the finest of all the Yuccas, the Mexican *Y. filifera*—so well figured in GARDEN AND FOREST, vol. i., page 78—formed a conspicuous feature on one of the lawns; a group of five huge stems, some fifteen feet in height, produced a fine effect.

A Mexican Berberis, *B. trifoliata*, with its dense growth and rigid spiny leaves, is one of the most conspicuous of the dwarf shrubs. A thorough contrast to this is the Eastern Australian *Citriobatus multiflorus*, with its small, round, deep green leaves and spines (abortive branches) twice as long as the foliage; this peculiar member of the Pittosporum family forms an excellent fence.

Away from the Villa Thuret, toward the end of the promontory, the Lentisk, Myrtle, Smilax and other indigenous plants, with here and there various Mesembryanthemums, etc., which have become naturalized, thrive in wild luxuriance among the rocks facing the sea, where in times of storm they are dashed with salt spray.

Geo. Nicholson.

Kew.

Foreign Correspondence.

London Letter.

AN event of very great importance to English horticulture is the decision of the Royal Horticultural Society to build for itself in a central position in London an exhibition hall, offices and library. The sum of £40,000 is to be raised in a manner both novel and commendable—i. e., the fellows of the Society and their friends are to lend the money, which is to be invested by trustees partly in first-class securities yielding three and a half per cent. interest, which will be required to pay ground rent, and partly in the new buildings. About £3,000 was promised at the general meeting on Tuesday last. The money is to be repaid without interest by the annual redemption of bonds.

This scheme was unfolded to the fellows by Baron Schroöder, a most liberal patron of horticulture, a member of the Council of the Horticultural Society, and one of the most successful bankers in London. The interest and zeal of the Baron in this business are looked upon as being an assurance of its success. In his speech the Baron commented on the very marked development in the last year or so of a taste for gardening and flowers among the business men of England and especially of London. The Society has only to place itself at the service of these thousands of recruits to horticulture to secure their fellowship and support. The Royal Agricultural Society numbers about 10,000 fellows and spends thousands of pounds annually in the promotion of agriculture in England. Horticulture, which is almost as important an industry as agriculture, is in need of the same unity and assistance, and the Royal Horticultural Society is the body on which the work of organization to this end naturally devolves. At present English horticulture is almost a house divided against itself. In no country in the world is horticulture of so much importance as in England, and yet until now nothing has been done to collect its forces and unite its followers under one banner. Baron Schroöder's scheme is a great step toward a remedy for this state of things. In a few years we shall wonder how the present want of a home and head for gardening and its followers was tolerated so long.

The plants shown last Tuesday included some interesting novelties. Large groups of Lenten Lilies (Hellebores) in variety, some poor, some exceptionally good; of Persian Cyclamens, early Daffodils and other herbaceous plants, were sent by various nurserymen. Messrs. Lee, of Hammersmith, once famous for Australian plants, now chiefly for hardy trees and shrubs, exhibited a tastefully arranged group of ornamental-leaved and bright-berried shrubs, such as could be employed for the embellishment of the out-door garden in winter. Aucubas, rich in berries and color, standard Ivies, Laurustinus, Osmanthus, Pernettyas, many kinds of conifers, Euonymus, etc., all remarkable either for variegation or elegance of habit—these were arranged in a sort of parterre garden. A very elegant Yucca, perfectly hardy and as graceful as a Cordyline, was represented by many beautiful examples. It is called *Y. plicata*, apparently a garden name. This plant is certain to prove of great value in countries where the Australian Cordylines cannot be grown out-of-doors, as it is an excellent substitute for them and as easy to manage as any garden Yucca. Of the plants known to me it is most like *Y. Peacockii*, a supposed Mexican species, described by Mr. Baker about ten years ago.

As is usually the case at these meetings, the Orchids were well represented. A strong spike of flowers of *Phalanopsis F. L. Ames*, recently figured in GARDEN AND FOREST, was exhibited by Messrs. Veitch, who also sent examples of *Cypripedium Lathamianum*, a handsome hybrid from *C. Spicerianum* and *C. villosum*, and especially interesting as being the first known instance of precisely the same result having been obtained by crossing two species both ways. As a rule, the difference between the progeny of two parents crossed differently is well marked and often wide. *C. Rothschildianum* was exhibited in flower, the raceme bearing three very fine blooms. It was named *C. Elliotianum*, but a comparison between it and the figure in the *Botanical Magazine* proved the name erroneous. There are good reasons for believing that the difference between *C. Rothschildianum* and *C. Elliotianum* is merely varietal, and that in many collections the same plant does duty for both. A handsome variety of *C. cardinale* named Vanner's variety was remarkably like your native Moccasin flower, *C. spectabile*.

Odontoglossum ramosissimum, introduced in 1871, remains a rare plant, although it is distinct and handsome. The flowers are two inches across, full, pale rose-purple, showing white here and there, wavy, the lip narrow and reflexed. A strong plant, bearing a stout, many-flowered panicle, was shown and received a first-class certificate. This species is very distinct and unusual in color amongst *Odontoglossums*. Some wonderful specimens of *Calogyne cristata*, *Cypripedium insigne*, *Lycaste Skinneri* and other well known Orchids were shown as examples of exceptional culture. The *Cypripedium* was a grand mass of foliage, and bore over a hundred expanded flowers. It was in a twelve-inch pot.

Greenhouse Rhododendrons were shown by Messrs. Veitch, amongst them being some beautiful deep colored hybrids recently obtained from *R. multicolor*, a Sumatran species introduced about five years ago, and distributed by Messrs. Veitch under the name of *R. Curtisii*. The charm of these new hybrids is in their dwarf, bushy, compact habit, small, dark green leaves and the brilliancy of their flower-colors. The Rhododendrons from the mountains of the Malaya regions are proving as plastic and prolific of beautiful garden plants, under the manipulation of Messrs. Veitch, as did the Andean Begonias in their hands about ten years ago. I believe I have already related in your paper the success met with at Kew in the cultivation of this class of Rhododendron in the large winter garden, where the temperature in winter sinks to forty-five degrees. It is quite clear that whilst they grow and flower freely when treated as stove or warm house plants, almost every one of the Malayan race of Rhododendrons may be successfully managed in a cold house. They require a rich peat soil and plenty of moisture at all times.

Washingtonia filifera.—The article by Mr. Parish on the Palms of California is a most interesting and valuable contribution to our knowledge of some of the most useful of European garden Palms. What he states with regard to Washingtonias and their names is fully borne out by observation here. I do not believe there is even a varietal difference between the plants called *W. filifera* and *W. robusta*. This conclusion was arrived at after seeing great numbers of these plants on the Riviera, where Washingtonias are very common in gardens. In a report on the garden plants of the Riviera which I wrote for the Kew *Bulletin* in December last the following particulars of these plants were given. I quote them as interesting when placed by the side of Mr. Parish's statistics re the distribution and dimensions of Washingtonias in California:

"Equaling the Canarian Phoenix (*P. Canariensis*) in its extensive use, in its proportions and in rapidity of growth, is the Washingtonia. The growth made by this Palm on the Riviera is astonishing, and it appears to thrive equally well in all the stations. There must be hundreds of thousands of plants of it in the gardens and nurseries visited, and the prices asked indicate that there is a great demand for it. . . . It does not appear to have been introduced into European gardens before 1875, and is therefore a comparatively new Palm. Notwithstanding this, there are some very large specimens of it on the Riviera, where it is called Brahea or Pritchardia. I could not see any characters in the plants pointed out as *W. robusta* to distinguish them from *W. filifera*; the reddish hue of the petiole at the base appears to be the principal difference.

"At Villa Valetta, Cannes, on a sloping lawn in front of the house, is a grove of about sixty magnificent specimens of this Palm, to me a marvelous sight. Most of these plants had huge onion-shaped stems, ten feet in circumference at the base and about ten feet high, some even higher. The crown of foliage was twenty feet through, and was composed of from

fifty to eighty leaves, each with a stout armed petiole five feet long, a blade four and a half feet across, and ornamented with numerous white, hanging filaments a foot long. I was assured that the largest of these plants was not more than twelve years old, and from the date of the introduction of the species this cannot be far from correct. At Nice I saw a specimen the stem of which was fifteen feet high. In exposed situations within a few yards of the sea this Palm is perfectly healthy."

The dead leaves are not allowed to remain on the stem, consequently the appearance of this Palm on the Riviera is very different from that of the wild plants as described by Mr. Parish. The Riviera gardeners manure their Palms most liberally and in dry weather they are kept well supplied with water.

Mr. Parish does not mention *W. Sonora*, a new species described by Dr. Sereno Watson, who sent a few seeds of it to Kew in 1888, from which we have now about a dozen good plants. At present their most striking character is the deep crimson-brown of the petioles and stem.

London.

W. Watson.

Hypericum Kalmianum.

Hypericum Kalmianum was one of the first of the American Saint John's Words described, having been discovered by the Swedish botanist, Kalm, whose name was bestowed upon it by Linnæus, probably at Niagara Falls, which he visited in 1750. It is a straggling bush, growing to a height of two or three feet, with rather contorted four-angled stems, covered with thin, exfoliating reddish bark, slender two-edged branchlets, and crowded oblanceolate pale leaves one to two inches long. The flowers are bright yellow, an inch across, and begin to open early in July. The pods are ovate and five-celled, a character which best distinguishes this species from the nearly allied *H. prolificum* of the middle and western states, the pods of which are three-celled.

Hypericum Kalmianum (see page 113) is rather a rare plant, being confined to lake and river-cliffs from the Falls of Niagara, where it is found on Goat Island, to the northern Lakes. Like the other shrubby Hypericums, it is an excellent garden plant, although less showy in flower than some of the other species. They all bloom at midsummer, when few shrubs are in flower; and grow easily, flower profusely, and are not particular about the treatment they receive.

New or Little Known Plants.

A Giant African Aloe.

A. Bainesii.

THE picture on page 115 is taken from a photograph made in Grahamstown, South Africa, and represents one of the most remarkable of the many arborescent species of Aloe found on the African continent. *A. Bainesii* was first described by Mr. Thiselton Dyer, the present Director at Kew, in the *Gardeners' Chronicle* in 1874, and it was named in honor of its discoverer, Thomas Baines, the African explorer, whose book, "Explorations in South-west Africa," is a most interesting account of his journey from Walvisch Bay to the Victoria Falls, which he accomplished in 1861-62.

The discovery of the Aloe is referred to in this book at pages 33, 34. Baines was at the time about a hundred miles east of Walvisch Bay, and near the Swa-kop River, when he noticed "what seemed like an ordinary Dragon-tree or Baobab, a familiar object to the South African traveler. On approaching to sketch it more minutely I found that it was a gigantic Aloe. Kneeling on the ground so as to bring my arms low enough to embrace the solid trunk, I found its circumference to be nearly twelve feet. Above this it divides into five stems, each of which at nearly the same height sent forth branches as thick as my arm, of uniform size, even to the top, where they were crowned each by the well known star of Aloe-leaves, and adorned with three or more magnificent spikes of yellow flowers. The stems were smooth and round; but at the base the bark appeared

to burst and curl off in large flakes, as if their veneers of fine satin-wood had warped off the foundation they were laid on. The effect of this magnificent crown of leaves and flowers, perfectly rounded in contour, and fifteen or more feet in diameter, and as many from the ground, contrasted

time a missionary in Kaffirland sent to Professor Macowan a description of an arborescent Aloe, which was considered distinct from *A. Bainesii*, and described under the name of *A. Barberæ*. It has been proved, however, since that time, that the two plants are identical.



Fig. 24.—*Hypericum Kalmianum*.—See page 112.

with the sterile rocks on which it grew, was lovely in the extreme."

The same traveler found this same species on the opposite side of Africa—namely, in northern Natal—and he forwarded a living branch of it to Kew, from which a plant now in the Kew collection was obtained. About the same

The illustration represents three plants which had been brought about twenty-five years ago from the Transkei, in Kaffirland, by Commandant Bowker, and presented to Sir Walter Currie, who at that time was residing in Grahams-town. They are at the present time in magnificent health, the dimensions of the largest being as follows: Height,

twenty-four feet; diameter of head, twenty feet; girth of stem at base, nine feet; girth eight feet from the ground, seven and a half feet; length of leaves, two and a half feet.

There is a beautiful specimen of this Aloe on one of the lawns in the Botanical Gardens at Grahamstown. The frequent branching, smoothness and roundness of the stems and remarkable habit of bark-peeling, similar to what occurs in the Oriental Plane—these characters, as well as the gigantic stature of full-grown plants, place this species of Aloe among the most remarkable of the many vegetable monsters found in Africa.

The practical value of this picture is in its presenting the features of a plant which may be grown in temperate and sub-tropical countries, and which is one of the easiest of Aloes to cultivate. In Grahamstown slight frosts are not infrequent, whilst the summer temperature and other climatic conditions are about the same as those of New York. In the south of France many species of Aloe are grown in the open, and their flowers make a magnificent display. It is easy to imagine the fine effect that might be produced in many gardens of your southern states by groups of such plants as these arborescent Aloes. In dry countries, or in poor, rocky localities, the African Aloes would be quite at home.

Kew.

W. Watson.

Cattleya labiata Warscewiczii, Autumn-flowering.

Cattleya labiata Warscewiczii, or *Cattleya gigas*, as it is often called, is a well known summer-flowering form. According to Messrs. Veitch (in their Manual) it generally flowers in the Orchid-houses of Europe in July and August, but it is not unusual for flowers to appear in May and June. A letter just received affords evidence that it may flower later as well as earlier than the usual period. The editor of GARDEN AND FOREST writes: "I enclose for your consideration a *Cattleya* flower and a sketch of the same. It is from a plant purchased by Mr. F. L. Ames several years ago from Low & Co. as an imported *C. Mendellii*. You see, however, that the flower is quite distinct, or, at least, Orchid people here say that it is, and, moreover, it flowers always late in November and in December, a peculiarity which gives this form great garden value. The leaves are short and broad like those of *C. Mendellii*. It is certainly a very showy and beautiful thing." The last remark I fully endorse, for the dried flower is seven and three-quarters inches in diameter, and the color very brilliant, so that when fresh it must have been a superb thing. On comparison it seems to me, botanically, identical with the form named above, well known to be the largest and most distinct of the *Labiata* forms, and one which, even when dried, can hardly be mistaken for any other. The sepals and petals are of a bright rosy mauve, the front lobe of the lip rich crimson-purple, and behind this are situated two large bright yellow blotches, separated by the reddish-purple disc. If the autumn-flowering habit should prove constant, as would appear from the letter, it is certainly a very valuable acquisition. That the plant should have been imported as the variety *Mendellii* is perhaps not remarkable, seeing that both are natives of the eastern Cordillera of New Granada, though I am not sure whether both have been found growing intermixed. It is just possible that Messrs. Low & Co. have some memoranda on the subject of the particular importation in which it appeared. Unfortunately such information is not often easy to obtain, especially when the subject is such a handsome plant as is the present one.

Herbarium, Kew.

R. A. Rolfe.

Since the above was written I have received a note from Mr. William Robinson, gardener to Mr. Ames, stating that the habit is remarkably like that of the variety *Mendellii*, and that it has maintained the same character for five years consecutively, flowering in November and December, after which it commences to make its growth, which is matured some four or five months before its flowering season, exactly as in *C. labiata vera*.

Cultural Department.

The Watermelon.

THIS fruit grows in hot countries generally, but has not so great a range of climate as the Cantaloupe. It appears to be divided into two distinct classes—one adapted to very hot localities, and the other not able to bear well more than a limited degree of heat. Those from the tropics grow larger and

finer in this latitude, and the melons of Spain and Italy do as well here as in those countries, although but few of them are worth introducing. Watermelons from milder climates than ours will grow in New Jersey soil, but are never inviting in flavor. When cut open they crack before the knife with a sort of explosive sound; are often white-fleshed, and seldom of a rich red; they are deficient in sweetness, and the flesh is sometimes tough. I have found one desirable Russian melon, one Spanish, three Italian, one Cappadocian, one Japanese and one African, in a large number of varieties tested from many countries. All of the vines I have examined were of the same peculiar, well known character of leaf, except one from Liberrian seeds, which had a large, solid, ovate-pointed leaf, set close to the stem, and growing right and left alternately, and parallel with the ground.

Watermelons are long, semi-long, oval and round; their seeds are black, brown, white, red, buff, gray and mottled. All of these colors may be found in very large, medium and very small seeds. As a general rule, a large melon bears large seeds, and *vice versa*, but there are exceptions. White-rinded melons may have very small black seeds, as in the Russian, or may be large and white, or buff with a brown edge. The most delicious melons, as a rule, are thin-rinded, and pink or dark red in flesh. Such Watermelons do not bear transportation well, the breakage in some being up to fifteen per cent. In interior colors we also find white, yellow and amber-colored.

Many foreign melons have very tiny seeds, and some of the fruits may be readily eaten by one person. Orange melons, or those having an easily separated rind, are said to be produced of very small size in Bulgaria and the extreme south of Italy, but have not yet been grown here.

Watermelons with very small seeds, down to half an inch in length, are quite abundant in some countries, especially southern Russia, Armenia and Sicily. In Persia the favorite is called a "black Watermelon," from its very dark green color, as we have the "black Italian"; it is very thin-rinded, and is easily broken in transportation. The Japanese produce a melon of a long apple-shape, having very tiny seeds and a thin rind, that grows well in our climate, and has been considered an excellent variety by private growers, but its small size has prevented its acceptance by the trade. Such fruits make good hybrids with larger varieties.

Large, tough-rinded, symmetrical melons of fine quality, which keep and carry well, are now produced in enormous quantities in our Southern States, and some may be carried in good condition to Europe or kept from the last of September to Christmas. As an article of diet the Watermelon requires a better digestive power in the eater than is required for the Cantaloupe, and some dyspeptics who consume the latter with comfort, do not dare to more than taste the former.

This country now produces a greater variety of large Watermelons than ever before, and they can be grown to a heavier weight. In 1800 there were melons in the Philadelphia market that measured forty-five inches in girth; but they did not grow them in our country of 108, 111 and 125 pounds until within a few years, when new varieties reached these weights, in favorable seasons and localities.

In the olden time, our Watermelons were chiefly long, oval, dark green or striped, and had large black or brown seeds. Spanish seeds produced our first thin-rinded melons; but these soon changed in character under the work of the bees. Spanish melons are still grown, but are altered in form over those produced by imported seeds.

The French have a peculiar way of keeping a melon; the fruit is cut with a long stem, which is coiled up and then buried under brown sugar to keep it from drying up by exposure to the air.—*From a paper read before the Pennsylvania Horticultural Society by Robert P. Harris, M.D.*

Reinwardtias.

THESE plants must be classed among the best that can be grown for the decoration of a warm greenhouse during winter. There are three species, all of which are found in a wild state on East Indian mountains. Regarding the species, Sir Joseph Hooker says there is good ground for believing the three to be mere varieties of a common type, and the two in cultivation would certainly confirm that opinion. These are *R. tetragynum* and *R. trigynum*—the latter perhaps better known as *Linum trigynum*. They are dwarf shrubs, of free growth and neat habit, with leaves of a pleasing dark green color, and large bright flowers, which, in the former, are of a delicate sulphur color, and in the latter of a more distinct yellow. At the outset it must be understood that these plants can be grown satisfactorily only by those who command a

greenhouse in which an intermediate night temperature (*i. e.*, a temperature of about fifty degrees) is maintained during the winter months. Many attempt their cultivation in cooler houses, and, being unsuccessful, the plants are regarded as worthless. Where proper attention is given to their requirements, on the contrary, they are most useful and attractive. Young plants are the most satisfactory, and they may be readily obtained from cuttings. The points of robust shoots will be found most suitable for cuttings; and, early in April, they should be inserted in pots containing sandy compost, then placed in moderate bottom-heat, kept close and shaded until rooted. Shading will then be unnecessary; air may be admitted daily;

the plants. The syringe must be used three times a day, so that insects may be kept in check and the surrounding atmosphere kept in that moist condition which appears so essential to the health of the plants. Less shading will suffice as the weather grows cooler, and they will then require protection at night. About the latter end of September they may be removed to the house again, where the atmosphere should be kept moist until they show signs of flowering. The moisture in the atmosphere and use of the syringe may then be gradually decreased, and, finally, the syringing discontinued when the first blooms expand. Attention to watering is now all that is required to ensure a continuous display of bloom through-



Fig. 25.—A Giant African Aloe (*A. Bainesii*).—See page 112.

and, to induce bushy growth, the extreme point of each cutting should be pinched out. When new growths appear on the cuttings they may be potted-off into three-inch pots—using a mixture of loam, peat, leaf-mould and sand, in equal parts—and grown-on in a warm house, in which a moist atmosphere prevails. Five-inch pots will be found large enough to admit the full development of such plants, and when well established in these they may be removed to a cold-frame. Here the pots should be plunged to the rim in ashes, or some such material, and arranged so that the plants will be as near the glass as possible. In summer the lights will not be needed, except to protect the plants from heavy or too frequent rainstorms. Shading from bright sunshine will be beneficial, but it must be removed at night and during dull weather, and it should never interfere with the free circulation of air about

out the winter. Where it is desirable to obtain larger specimens the plants thus obtained may be grown on during the following season. Flowering will be discontinued early in February, and the plants may then be removed to a sunny house and rested slightly for a few weeks. They may be cut back about the beginning of April, and, a few days after, again placed in a growing atmosphere. When growth has commenced, turn them out of the pots, reduce the balls slightly and repot in five-inch pots. On being returned to the house they must be syringed overhead regularly, but great care should be exercised in the application of water to the roots until the plants get well started. Pinch the leading shoots when the young roots reach the sides of the pots, and about two weeks after pinching, the plants that have made good progress may be potted-on into seven-inch pots, and removed

to a cold-frame when established, and afterward treated as they were the previous year. In this way old plants may be grown on from year to year, and gradually increased in size; but it should not be forgotten that they rarely give as much satisfaction as young plants raised from cuttings. As the flowers soon drop, they are almost valueless when cut; and even upon the plants they remain in perfection for only a comparatively short period; but they are speedily replaced by others, and so the plants remain attractive.

Cambridge, Mass.

M. Barker.

Orchard Experiences.—II.

THE distance at which our various fruit-trees should stand in an orchard is a subject yet worth discussion, notwithstanding the voluminous teachings of our books and journals. For old-fashioned, slow orcharding, where standards in grass are expected to come into profitable bearing in from twelve to fifteen years, nothing is better for Apples than the old rule of forty feet each way. I would apply the same limit to Pears, notwithstanding the upright growth of so many varieties of this fruit. The habit of growth is of small importance in the premises. An upright habit gives more air and light between the trees, but this does not justify closer planting, when we remember that an upright tree may be quite as productive as a spreading one. If space is given to ensure sufficient feeding ground, the upright-growing tree, equally productive, requires as much root-room as those of a spreading growth. In these wide-planted, grassy orchards, from which the hay is annually removed, and to which only occasional top-dressings are given, we can only hope for biennial crops. Tillage and manuring is required to make annual producers. Even these will not ensure yearly crops with all varieties.

Under a different system, early-bearing sorts being used, quicker and better results may be obtained by much closer planting, provided the fertilization and tillage are commensurate. With these early-bearers, planted twenty feet each way, much more prompt and profitable results may be had. The fruit on young trees, well cared for, is large and handsome, selling at high prices, and a large quantity may be obtained in the ten or twelve years before it is necessary to thin out the orchard. The close setting is a protection to both trees and fruit; but an orchardist adopting this method must be prompt and resolute in thinning out his trees. When the crop reaches about five or six bushels to the tree it is time to remove every alternate row; and in about five years more we must take out alternate trees in the remaining rows. We then have left our twenty-five standard trees to the acre, and have taken off, meantime, enough choice fruit to much more than cover every expense. Those who adopt this method sometimes prefer to have the trees which are to be removed something else than Apples—either Plums and Cherries, or dwarf Pears. In my latitude I find the early-bearing, short-lived Russian summer Apples, especially the Yellow Transparent, best. They begin bearing quite freely within two or three years, and have seen their best days by the time it is necessary to remove them. Between the trees, one way, Currants, Gooseberries and Black-caps thrive, with no apparent detriment to the trees. This is a great deal better than the old way, especially to those who have reached middle age before beginning to plant, or to those who need an immediate income from the land. For the first five or six years Dwarf Beans and Peas, or Strawberries, may be successfully grown in the young orchard. Liberal manuring and clean culture are essential.

Newport, Vt.

T. H. Hoskins.

Seed-growing is now the order of the day, and it is as fascinating to some of us as it is important. Success or failure often turns on very slight and apparently unimportant points, and as hints are always in order, I wish to note that in case of fine seeds, especially of Begonias, I find that success depends much on sowing very thinly. The point of a small knife-blade will hold enough seed for the sowing of a pan six inches square, and more is worse than waste, for if the soil is covered with visible patches of seed it seems to be fatal to their germination. From such a quantity of seed, sown thinly, I have known 600 plants to be pricked off, while in over-seeded pans plants appear very sparsely. The culture of Begonias from seed offers no difficulties. It is sometimes stated that young seedlings are inclined to "go off," but this must be from badly aired house, as under proper treatment there are few less "miffy" things.

Doronicum Harper Crewe, besides being a good plant for the cool house, as noted by Mr. Thorpe, is a first rate garden plant, perfectly hardy, and probably the earliest-flowering hardy herbaceous yellow Composite. It is a plant of distinct aspect, and the best of the family, about two feet in height, with numerous

flowers, as described. The foliage in the open is of the light, tender green so grateful in the spring garden. In its habit of growth it resembles the Oriental Poppy, the foliage dying down after bloom is over, to start again in the fall, a valuable trait in a spring-blooming plant, since by planting something of later growth near it, one has practically two crops from the same space, always a point of importance, and especially so in a small garden.

Elizabeth, N. J.

J. N. Gerard.

Correspondence.

The Uses and Claims of Forestry Associations.

To the Editor of GARDEN AND FOREST:

Sir.—There has been for some years past in America a marked and constantly increasing interest in, and perception of the needs of, forestry, or, to use a broader word, forest-reform—*i. e.*, the adoption of some adequate check on forest-destruction and some rational system of forest-preservation. The growth of the forest-reform idea is shown in the conversation of the people one meets, in the columns of the newspapers, in the existence of your own journal, devoted in part to the subject, and also in the formation of a few forestry associations, of whose work, indeed, it is itself partly a result. Yet though thousands are aware of the evils we now suffer from forest-destruction, and of their necessary continuance and increase unless our treatment of forests be radically changed, practically nothing is done. The tree-planting in the prairie states has been chiefly for shade or wind-breaks, not for timber supply, or to protect the sources of streams, which usually rise in the hills, where the axe is known, but not the spade. In the east some enthusiast may have here and there reclaimed a few waste acres by planting, and taught a good object lesson thereby; but of real forest-reform, the systematic retention of forests where they are needed, especially on mountain slopes, their cutting with a view to future growth, and their protection from fire, there has been practically nothing, east or west. In New York, the appointment of three gentlemen to protect the forestry interests of the state and the sources of the Hudson and Mohawk, without pay, would be laughable were it not too serious; yet this, and the slight check on fire thus brought about, is more than almost any other state has done. Common sense bills have been presented, both in Congress and state legislatures, but they have never come out of the committee rooms alive, and the prospect, except possibly in New York, is not much more encouraging now than it was ten years ago.

In short, it must be confessed not only that, in the vast majority of cases, the interest really felt in forest-preservation has not resulted in any actual work, but even that a great deal of honest and conscientious effort has been wasted. The reason, to my mind, is not that there are not enough people who believe in forest-reform, but that they are not sufficiently united, or, to speak plainly, that only a very few of them belong to forestry associations. That union is strength, and disunion weakness, no American needs to be told. It cannot be claimed that the forest-reformers have hitherto shown any of the fruits of strength, and that they are not united the small membership of the American Forestry Association and the few state and county societies clearly proves. The Pennsylvania Association, founded in 1886, heads the list with 650 members; but can one imagine that there are but 650 people out of the 4,000,000 inhabitants of that state who care for forest-reform, and can afford a dollar a year toward obtaining it? The smaller numbers of the American Forestry Association may be due to its origin as primarily a congress of delegates from state societies, not an association of individuals, but, owing to the lack of delegating bodies, its strength is chiefly derived from its own members. If the associations, the only visible bonds of union between believers in forest-reform all over the country, are few and small, is it not due to this that, in spite of the warnings both of intelligent men, and of drought, and flood, and land-slide, warnings whose truth is widely realized, forest destruction continues unchecked in America?

Forestry associations, especially if able (as none of them yet are, I believe) to employ paid officers or agents, can do a far greater work than the aggregate of their members individually. They can collect and diffuse information, instruct, encourage, develop public opinion, secure and enforce legislation, and work in many ways for which individuals lack time, money, opportunity or popular support. Owing to lack of means their work hitherto has been small, but not wholly profitless, and not a tenth of it would have been done without them. Besides, they give individual effort a scope and stimulus as nothing else does. A man deeply interested in forestry

is far more likely to speak and write about it, to get up meetings for it, to seek to have it taught, to urge legislation for it, to have it tried on his own land or that of his hunting and fishing-club, if he belong to an association, and feel it a duty to his associates to spread the gospel in every way he can, than if he do not; and those who can do the least individually can, by their subscriptions, greatly increase the opportunities and effectiveness of the workers.

Two very useful classes of people have as yet held aloof in large numbers from the forestry associations—viz., those who know something about forestry and those who do not. The latter, as the majority in the community, must largely constitute any forestry association which hopes to wield the powerful influence of numbers in this democratic land. They are ten times as likely to learn something about forestry inside an association as out of it, and their sinews of war are as good as those of the greatest scientists. To scientists, however, a successful association must always look for inspiration and guidance. The principal officers ought certainly to be men of reputation, especially in forestry and botanical science. How else can a forestry association attract outsiders, and show them that it exists for real work, to be done by real workers, and not to amuse a few amateurs? What influence upon public opinion and public men can an association exert when many of those best fitted for its peculiar work stand aloof? It should not be forgotten that the American Forestry Association is the child of Hough and Warder, and their successors in the work of investigation and instruction should succeed them also as the natural guardians of this and kindred bodies. Of course, every such society includes some scientific men, but not enough of them. If they think these associations too amateurish, let them personally add the leaven of practical science.

It may be urged that existing agricultural and horticultural societies can do the work. If they are willing to undertake it, well and good; but they usually exist chiefly for the instruction of their own members, whereas forest-reform, for many years to come, can only be achieved by enlightening the people and developing public opinion.

To conclude, I do not see how real forest-reform can ever be secured in this country except by the work of associations organized for that purpose. The effectiveness of this work must depend on the numbers, the liberality and the intelligence of the members. On all men and women who believe in forest-reform such a society has a claim, whether they can give but a little money and a good word, or the talents and the knowledge which have been entrusted to their keeping, not alone for their own profit and fame, but for the benefit of their fellow-men.

Philadelphia, Pa.

Charles C. Binney,
Cor. Sec. American Forestry Association.

A Gardener's Problem.

To the Editor of GARDEN AND FOREST:

Sir.—On page 42 of your issue for January 22d, your correspondent, Mr. William Watson, illustrates his views by some statements which seem to need correction. He mentions *Nepenthes Rajah*, a plant introduced alive to Chelsea by Mr. Peter Veitch and myself in 1878—that is, about twelve years ago, instead of six years, as stated by Mr. Watson, who may, however, have been misled by the date when the plants were distributed. This inaccuracy is a trifling matter; but one of more consequence occurs in the foot-note, where it is stated that *N. villosa* thrives "only in the hottest and moistest stove," when the fact is that this plant has never yet been brought alive to European gardens. No doubt Mr. Watson, when writing, had *N. Veitchii* in his mind, a plant totally different and distinct from *N. villosa*, although formerly grown in error of its true name as *N. villosa* in English gardens.

My friend Mr. Moore, of Glasnevin, was better informed as to the native climate and surroundings of these Pitcher plants than Mr. Watson has inferred. When I presented the plant of *Nepenthes Rajah* to Mr. Moore I also told him of the native conditions, and it is a proof of his intelligence and skill that he has so far cultivated this plant when scores of other good plant-growers have failed. These native climatic conditions are so peculiar that I may here state them in a brief way. The four most interesting *Nepenthes* found wild on Kina Balu are *N. Lowii*, *N. Edwardsiana*, *N. Rajah* and *N. villosa (vera)*. They are found on the southern spur in the order named, commencing with *N. Lowii*, at 5,000 feet, and ending with *N. Rajah* and *N. villosa*, at 9,000 to 10,000 feet. This enormous mountain range is about sixty miles from the sea-coast, and the interven-

ing country consists of low ranges of coast-hills and rich alluvial plains and marshes. The topmost peak above the great southern spur is 13,700 feet high. It naturally follows that this mountain affords an enormous range of climate and temperature. The thermometer descends to freezing point at the top, and there is sleet, but no snow has been seen. The day temperature of the sea-coast and plains is generally from eighty to ninety degrees in the shade, and perhaps ten degrees lower only on the coldest nights. The great granite peaks of this mountain, even at the distance stated, are cold enough and massive enough to attract a current of hot, moisture-laden air from the sea, and this current sets in every day about four or five o'clock. The diagram here given will illustrate what occurs better than words.

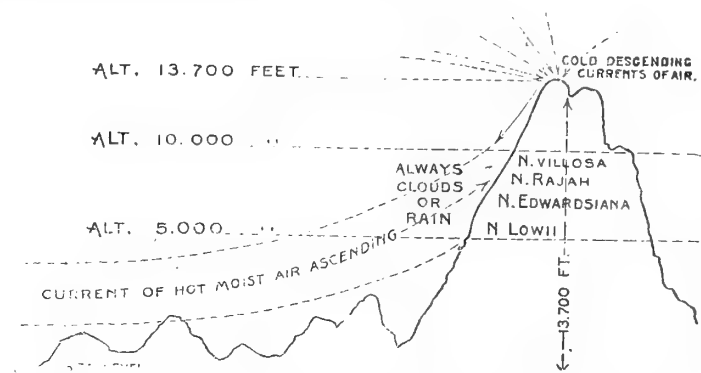


Diagram showing hot and cold air currents on the sides of the mountain in Borneo, meeting and condensing at the *Nepenthes* zone.

Every night in the year there is a deluge of rain in what I have called the *Nepenthes* zone of this mountain, that is, from 5,000 to 10,000 feet in altitude, and even if not raining in the day-time there is a constant state of what has been called "Scotch mist," or air-clouds condensing into small rain, which wets one to the skin most thoroughly in half an hour. All the time I was up this mountain (I was there on two occasions in what below were the wet and dry seasons), I never had a dry thread to my back except at night in the cave with a great bonfire blazing outside. The native guides from the last village on the road, Kiau (altitude 3,000 feet), found the wet and cold (forty-nine to fifty-five degrees Fahrenheit) on this mountain too much for them, and they became quite paralyzed and finally left for their homes rather than endure the chilly dampness of this Pitcher-plant paradise. At 9,000 to 10,000 feet altitude the trees are low and scrubby, and covered with long moss, filmy ferns (here I saw the trees draped with the rare *Trichomanes pluma*, only seen alive previously by the veteran plant hunter, Tom Lobb), and Lichens or Usnea, and creeping, monkey fashion, amongst this vegetation, was only another name for a perpetual shower-bath from the branches overhead.

From what I have said, I think that my friend Mr. Watson will perceive that when Mr. Moore transferred *Nepenthes Rajah* from a hot and dry temperature to a comparatively cool and moist one, he approached the natural conditions under which this noble plant was found growing by me, and hence, no doubt, his superior measure of success. All these upland or mountain *Nepenthes* are more or less difficult of culture, and extremely difficult to import, owing to the heat of the plains and the sea voyage. On the other hand, the species found in marshy forests at or near sea level are comparatively easy, requiring heat and moisture only, with a moderate amount of shade. One *Nepenthes*, viz., the well known *N. Rafflesiana*, is the first weed to appear after forest or jungle fires in Borneo and Labuan.

Botanical Gardens, Trinity College, Dublin.

F. W. Burbidge.

The Waverly Oaks.

To the Editor of GARDEN AND FOREST:

Sir.—Your recent editorial on the Waverly Oaks, with its plea for the preservation of the charming scene in which they stand, prompts me to lay before you an imperfect outline of a scheme by which not the scene at Waverly only, but others of the finest bits of natural scenery near Boston, might perhaps be saved to delight many future generations.

But first a few words on another pressing problem. It is everywhere agreed that a great and growing population, such as now inhabits Boston and her wide-spreading suburbs,

should, for its own best health, provide itself with all possible open spaces in the form of public squares and play-grounds. Boston (including now the various municipalities which surround her) is far behindhand in this matter. Large areas outside of the old city are wholly unprovided with public open spaces; and while the various municipalities which compose this larger Boston continue to be fearful of spending money for the enjoyment of their neighbors, there can be little hope for much improvement. The difficulty arising from the conflicting interests and desires of these many towns and cities delayed the construction of a proper sewerage system for the suburbs, until the danger and the scandal which the lack of such a system caused fairly compelled the state to create a Metropolitan Drainage Commission, with power to plan and to build a complete main drainage and to assess the cost thereof upon the towns and cities benefited. It looks now as if the acquisition of a suitable number of well distributed open spaces must wait for the appointment of a similar commission. Meanwhile the available open ground is being rapidly occupied; and Boston, like New York, may yet be compelled to tear down whole blocks of buildings to provide herself with the needed oases of light and air.

But a crowded population thirsts, occasionally at least, for the sight of something very different from the public garden, square or ball-field. The railroads and the new electric street railways, which radiate from the Hub, carry many thousands every pleasant Sunday through the suburbs to the real country; and hundreds out of these thousands make the journey for the sake of the refreshment which an occasional hour or two spent in the country brings to them. Within ten miles of the State House there still remain several bits of scenery which possess uncommon beauty and more than usual refreshing power. Moreover, each of these scenes is, in its way, characteristic of the primitive wilderness of New England, of which, indeed, they are surviving fragments. At Waverly is a steep moraine set with a group of mighty Oaks. At the Upper Falls of Charles River the stream flows darkly between rocky and broken banks from which hang ranks upon ranks of graceful Hemlocks. These two remarkable scenes have been described in GARDEN AND FOREST; and I shall name no others, though several are well known to all lovers of nature near Boston. One is the solemn interior of a wood of tall White Pines—the tree the forefathers blazoned on their flag. Another is a Pine grove on a group of knolls in the bend of a small river, where it first meets the tide and the salt marshes. Still another is a hill-side strewn with great boulders, and commanding, by a bowl-shaped hollow of the hills, a distant view of the ocean and its far horizon. At present all these beautiful scenes, excepting such as are included in the Franklin Park and the adjacent Arnold Arboretum, are in private hands; and many of them are in daily danger of utter destruction—some of the finest spots have been destroyed within the ten last years. Most of them lie outside the municipality of Boston proper. They are scattered in different townships or along the borderlines, and only an authority which can disregard township limits can properly select and establish the needed reservations.

The end to be held in view in securing reservations of this class is wholly different from that which should guide the State Commission already suggested, and the writer believes this different end might better be attained by an incorporated association, composed of citizens of all the Boston towns, and empowered by the state to hold small and well distributed parcels of land free of taxes, just as the public library holds books and the art museum pictures—for the use and enjoyment of the public. If an association of this sort were once established, generous men and women would be ready to buy and give into its keeping some of these fine and strongly characterized works of nature; just as others buy and give to a museum fine works of art. Indeed, the association might even become embarrassed, as so many museums are, by offerings which might not commend themselves to its directors.

Lovely natural scenery supplies an education in the love of beauty, and a means of human enjoyment at least as valuable as that afforded by pictures and casts; and if, as we are taught, feeling for artistic beauty has its roots in feeling for natural beauty, opportunities of beholding natural beauty will certainly be needed and prized by the successive generations which are to throng the area within ten miles of the State House. As Boston's lovers of art united to found the Art Museum, so her lovers of nature should now rally to preserve for themselves and all the people as many as possible of these scenes of natural beauty which, by great good fortune, still exist near their doors.

Boston.

Charles Eliot.

Orchids in Brooklyn.

To the Editor of GARDEN AND FOREST:

Sir.—It would be difficult to find better specimens of *Phalænopsis* than those in the collection of Mr. Frederick Scholes, of Brooklyn, and at this season of the year, when great numbers of them are in bloom, they are specially attractive. There were more than 2,000 fully expanded flowers on February 20th and the spectacle was one not easily forgotten. Among the plants I noted some good examples of *P. Schilleriana*, literally covered with its beautiful mauve colored blossoms, one specimen having eight spikes, which were short, well branched and carried over 300 flowers. To this variety the owner has given the appropriate name of *P. Schilleriana compacta*. It has three strong growths, and eighteen broad, leathery leaves, which measure from ten to fourteen inches in length. Another specimen of an admirable variety was carrying 200 flowers, while a dozen others were also equally well flowered. A fine specimen was a plant of *P. grandiflora*, with three growths and thirteen leaves, which had three strong spikes, well covered with large white blossoms. *P. amabilis* was well represented by specimens with strong stems freely branched and covered with flowers. One plant with eight very large leaves had a spike three feet long. The white and purple-spotted flowers of *P. Stuartiana* were very attractive, and one plant had produced a panicle carrying sixty flowers. *P. Sanderiana*, which much resembles a rose colored *P. amabilis*, was represented by several very dark varieties. The plants occupy wire baskets, and are suspended some two feet from the glass, and are grown moderately warm. On the stages few Orchids were seen, the space being occupied by Palms, Ferns, Eucharis, etc., which are syringed daily, furnishing an atmosphere which the plants above appear to thoroughly enjoy. In the same structure several plants of *Cattleya Lawrenceana* were in bloom, as well as of *C. intermedia*, *C. speciosissima* and *Dendrobium Ainsworthii*. Several plants of the scarce *Odontoglossum Humeanum* were in the house set apart for cool Orchids, together with the pretty yellow and brown spotted *Oncidium micropogon*, and the orange-scarlet flowered *Lalia harpophylla*.

A. Dimmock.

Summit, N. J.

Periodical Literature.

The most interesting paper in the December number of the *Kew Bulletin of Miscellaneous Information* for horticultural readers is an account of the tropical and sub-tropical plants growing in the gardens of the Riviera, from the pen of our London correspondent, Mr. W. Watson, who was sent last autumn by the authorities at Kew to examine the garden vegetation in southern France, for the purpose, primarily, of determining whether many plants now grown in England, in stoves and other warm houses, might not be treated more successfully in a more temperate atmosphere. Mr. Watson's report contains most valuable information for the gardeners of southern California, where the climate is not unlike that of Provence and of the southern Atlantic states, and nothing but its length prevents us from reproducing it entirely. Our quotations, however, must be confined largely to Mr. Watson's remarks about Bamboos, plants which American gardeners know very little about yet, but which are beginning to attract considerable attention both in California and in Florida and Georgia. "After the Palms," he says, "the most tropical feature in the gardening of the Riviera is the Bamboos, which are largely used in the composition of the best gardens, both public and private. To a northern gardener the elegance and grandeur of some of these Bamboos constitute some of the chief charms of the Riviera. Some of the specimens are very large, as for instance one of *B. vulgaris*, in Baron Vigier's garden at Nice, which measures forty feet through in every direction, and is thirty-five feet high. It contains hundreds of stems or canes, each three inches in diameter, and straight and smooth as a gun-barrel. It is planted on one side of the lawn near the house. As fences, screens and boundary lines the Bamboos are frequently used, and nothing could be better, as they are quick growers and evergreen. All the kinds noted were in splendid health, and from the manner in which they had taken possession of the ground, it was evident that their requirements are abundantly satisfied. The finest and healthiest examples are in wet ground, often on the edge of water. Most of them are heavily manured annually.

"In England we have not hitherto made the most of this beautiful family of plants, many of which may be grown out-of-doors successfully in all the milder parts of the country,

whilst in large conservatories, where they would get protection from cold in winter, a still greater number would be found to thrive. That they are much superior to many of the plants at present used for such positions must be evident to any one acquainted with the extraordinary elegance and grace of a well-grown Bamboo.

"The Kew collection comprises over fifty named sorts, a few of which are tropical, whilst the bulk of them are either quite hardy or require only the temperate conditions supplied by the winter-garden.

"The names of Bamboos are as confusing as are those of garden Palms. In one as in the other it is only very rarely that the plants flower under cultivation, so that many of the names, which are given by nurserymen, can only be problematical. For garden purposes this would not be of much consequence, the difficulty arising only when growers do not agree as to what names the plants shall bear.

"Now that so many kinds of Bamboos are in cultivation under favored conditions on the Riviera, it would be worth while to watch them, and as they flower, get them properly determined.

"It is generally supposed that nearly every member of the Bamboo order perishes immediately after flowering. There are many recorded instances of this having occurred. But with regard to a considerable number of the species the exact flowering age has not been ascertained. Some are said to grow forty years before flowering. Another remarkable fact is that all the plants of one generation flower at the same time, no matter how different may be the conditions in which they happen to be placed. I was told that all the plants of *Thamnocalamus Falconeri* (*Bambusa gracilis*) of the Riviera flowered and died last year. Numerous seedlings have since sprung up about the old stools, but the latter certainly all perished. This proved to be the case with a plant of *Arundinaria falcata*, which flowered at Kew in 1886.

"The following are the kinds noted. The names in brackets are what I consider to be the correct names, according to Munro, etc.

"*B. aurea*.—A Japanese species, now well known in gardens. It was in cultivation at Kew in 1866, and is here still. It is one of the most elegant of the hardy Bamboos. In the gardens of the Acclimatization Society, at Hyères, there is a magnificent specimen with stems twenty-five feet high, and not more than one and a half inches in diameter. The nodes are prominent, and less than four inches apart on the lower part of the stem. When ripe the stems are of a rich greenish yellow color. The leaves are small, with a distinct petiole.

"*B. gigantea* (*Dendrocalamus giganteus*).—The largest of all the Bamboos. The specimen in the Palm House, at Kew, produces stems forty feet long and twelve inches in circumference, but wild plants have stems as much as twenty-six inches round. In the garden at Villa Valetta, Cannes, there is a very fine mass, with stems thirty feet high and four inches in diameter. It is a native of India.

"*B. gracilis* (*Thamnocalamus Falconeri*).—A slender and somewhat fragile stemmed plant from the Himalayas. It is not uncommon in gardens, as it makes an elegant pot plant. It was plentiful on the Riviera till last year, when all the plants flowered. There is a plant at Hyères called *B. gracilis rustica*, in which the leaves are narrow, with incurved margins.

"*B. Mazellii*, Hort.—Fine masses at Hyères and at Cannes. The stems are twenty-five feet high, bright yellow when mature, the nodes prominent and close together at the base, the branches loose, and the leaves short and twisted on the petiole. It looked suspiciously like *B. aurea*.

"*B. Metake* (*Arundinaria Japonica*).—Much used on the Riviera, where it is as ornamental as it usually is in England. It is always strongest when grown near water, although it grows well in an ordinary border. At Kew there is a specimen twelve feet high. According to Munro it is known as *B. mitis* in the gardens of Paris.

"*B. mitis*.—A magnificent specimen on the lawn at Villa Valetta, the stems thirty feet high and three inches in diameter at the base, becoming shining yellow with age. The nodes are prominent and about nine inches apart, the leaves short and not dense. There is a small plant of it at Kew, obtained last year from Lavallée's collection. It is said to be from Cochin China.

"*B. (Phyllostachys) nigra*.—A clump of this, twenty yards through and rising to a height of thirty feet, in the garden of Baron Vigier at Nice, was one of the most striking objects seen on the Riviera, thousands of naked, shining, blackish purple stems rising from the lawn and losing themselves in the mass of green foliage above. This species is quite

hardy in England, but it does not grow to its full height except when in a very sheltered situation or under glass, as at Chatsworth, where in the large conservatory it is exceedingly handsome.

"*B. quadrangularis*, a very interesting species from China, with stems fifteen feet high by one inch in diameter, and distinctly quadrangular; the nodes are armed with decurved teeth-like spines. These dimensions are of a clump six feet through on one of the lawns at Villa Valetta. There are plants at Kew, both outside and in the temperate house. It is a handsome and distinct Bamboo. For an account of it see an article in *Nature*, vol. xxxii. (1885), p. 391.

"*B. Quilloyi*.—I cannot find any information with regard to this plant. Carrière described a Bamboo in the *Revue Horticole*, under the name of *B. Duguiltoii*, but Munro appears to have referred this to *Phyllostachys puberula*, included by him under *P. nigra*. The plant known under the above name is represented at Hyères by a large clump with stems twenty-five feet high, one and a half inches in diameter, bright yellow, with a faint tendency to become quadrangular. We have a plant of it at Kew. It is a most elegant Bamboo.

"*B. scriptoria*, Hort. (*B. nana*).—I believe that *B. scriptoria* of the Riviera gardens is merely a form of the well known Chinese *B. nana*. It has the same dense habit, thin green canes, and small leaves with the under side glaucous, which characterize *B. nana*. In some of the specimens seen the stems were nine feet high. A variegated form called *B. scriptiorionis* is the same as is grown at Kew as *B. nana variegata*.

"*B. Simoni*, a beautiful Bamboo, and perfectly hardy in England, as is shown by the fine example in the Cambridge Botanic Garden, and by the plants at Kew. It is also very handsome at Hyères, where the canes are fifteen feet high, quite smooth and cylindrical, less than an inch in diameter and colored deep olive green. This plant is worth the attention of English horticulturists on account of its elegance and hardiness, and its evergreen character.

"*B. sulphurea*.—Apparently a garden name for a very handsome Bamboo, with stems eighteen feet high, one and a half inches in diameter, the nodes nine inches apart, and the internodes deeply furrowed on one side. When mature the stems are rich orange-yellow in color. There is a fine mass of it at Villa Valetta. It is also in the Kew collection.

"*B. verticillata*.—This is probably the 'Male Bamboo' (*Dendrocalamus strictus*), a common Indian species, the stems of which, according to Munro, are universally used as lance-staves. The specimens seen were large clumps, the stems twenty feet high, one inch in diameter, the nodes at the base a foot apart, the upper ones bearing each a crowded cluster of short leafy branches. When old, the stem is bright yellow. It is a well marked, handsome Bamboo.

"*B. virescens*.—A beautiful Chinese Bamboo which was introduced to the Jardin d'Acclimatation in 1870, in the branch of which at Hyères a fine clump was noted. The stems are ten feet high, three-fourths of an inch in diameter, much branched toward the top, the internodes somewhat flattened on one side, and striped with violet on a greenish yellow ground. The leaves are glaucous on the under side. Young plants of it are in the Kew collection.

"*B. viridi-glaucescens*, Hort.—One of the handsomest of cultivated Bamboos. It is quite hardy in England, and in France it is one of the commonest. It grows very rapidly, has handsome foliage, transplants easily, and is a first-rate pot plant. It is frequently used in France for the embellishment of entrance halls, and is very effective. The stems of the Riviera plants were over twenty feet high, very slender, the nodes about a foot apart, dark green when young, bright yellow when mature.

"*B. vulgaris* (*B. Thoursii*).—Some astonishingly large, healthy specimens of this well known species were met with. Apparently it does not require tropical treatment such as it usually gets. At Hyères, Cannes and Nice it is especially fine, in the last named place measuring forty feet through and the canes thirty-five feet high. The plant in the Palm house at Kew must be thirty years old; it has not yet flowered."

Palms are the most prominent feature in many of the towns of the Riviera, and the chief beauty of many gardens is produced by groups or single specimens of Palms of various kinds. At Hyères the common Date Palm is used as a street tree, and at Bordighera this Palm is extensively cultivated for the sake of its leaves, which are used for the decoration of churches and are sent as far away as to Paris. No less than sixteen genera of Palms are represented in these gardens. Mr. Watson describes the Washingtonia, the Desert Palm of California, as "one of the glories of the Riviera," and

reference to this plant is made again in his letter on page 112 of this issue.

Next to the Washingtonia, *Phoenix Canariensis* seems to be the most satisfactory Palm in the gardens of the Riviera, where it grows very rapidly and soon forms a magnificent head. Agaves, Furcraas, Beaucarneas, and other so-called succulent plants flourish in these gardens, where Yuccas are seen in greater variety and beauty probably than anywhere else. There is a specimen of *Yucca filifera* (see GARDEN AND FOREST, i. 78.) in the gardens of the Villa Valetta with a stem three feet in diameter at the base, and several other species or varieties are represented by large individuals.

Notes.

Théodore Frœbel, the founder and head of the well known nursery establishment of Frœbel & Cie., of Zurich, retires from active business, and is succeeded by his son and partner, Otto Frœbel, in whose name the business will now be conducted.

Aralia Sieboldii variegata is attracting attention as a handsome and serviceable plant for house decoration, its tough leaves being well adapted to such use. The variegation appears, however, to be somewhat fickle, and possibly may be much improved by proper selection.

Experiments in Olive culture, made by the University of California, are of great value to all growers in that region. Twelve imported varieties have been grown at the agricultural stations, and the result shows that between the Mission and Picholine, varieties mostly grown in California, the Mission is far superior in amount of meat and yield of oil.

The hybrid perpetual Rose, Ulrich Brunner, has been forced quite early in the season in a number of the large Rose establishments, and has proved the finest bright red Rose for this purpose. It is of large size and particularly lively in color. As an offset to this, however, it is claimed by some growers that this Rose is hardly productive enough to become a very profitable variety for forcing.

Another reminder of the prevailing mildness of the present season was seen at the recent meeting of the Pennsylvania Horticultural Society in the form of flowers of the Cape Pond Weed (*Aponogeton distachyon*) from out-doors. The exhibit in which this was seen was from the garden of a lady living near Philadelphia, and included cut blooms of about a dozen other species of flowering plants, most of which looked strangely out of season in February.

Dr. Harris states that the seeds of imported Watermelons do not change in form, size or color by being grown here, as those of the Cantaloupe do, except under hybridization. The number that is produced by one fruit is occasionally very large, as high as 1,160 perfect seeds, of a weight of five ounces, having been taken from a melon of forty-nine pounds. Such productiveness is rare, as the number rarely exceeds 600; that of the Calabash reaching the same, the Cantaloupe 500 or more, and the Cucumber 450.

At the February meeting of the Pennsylvania Horticultural Society, held in Philadelphia, an attempt was made to test the relative popularity of the hybrid perpetual Roses, Madame Gabriel Luizet and Mrs. John Laing; the choice was made by ballot, and resulted in a majority of twenty-seven votes in favor of Madame Gabriel Luizet in a total vote of about ninety. A similar contest between La France and the Duchess of Albany resulted in a majority for the first-named. It would seem that these two varieties (Madame Gabriel Luizet and La France) are securely fixed in the affections of the Philadelphia horticulturists, and may not easily be displaced by the newer varieties, even though these are Roses of the very first rank.

Orange culture at Jaffa, according to Consul Gilman, has become an industry of great value. Of the 9,000 acres of cultivable land pertaining to the community, 3,000 acres are covered by Orange groves and gardens; and these are all under irrigation. Among the other fruits produced are the lemon, lime, citron, date, peach, apricot, grape, fig, pomegranate, plum and melon, as well as the olive. All the ordinary garden vegetables are also grown here of good quality and in abundance. Of late, the Vine, especially, is receiving increased attention and care; extensive vineyards are being planted; and as here the Vine is free from the diseases and insect pests of other countries, and the soil and climate are peculiarly adapted to it, this should be one of the most flourishing wine-producing countries in the world. The Olive does best in the hill country, and generously responds with abundant crops to the slightest care.

Dr. C. C. Parry died at his home in Davenport, Iowa, on the 20th of last month, from pneumonia, which followed an attack of influenza, contracted in the east. He paid a long visit to botanical friends in the autumn and early winter, and while here was busy investigating various matters connected with the California flora. He was then in perfect health apparently, active and alert in mind and body, and full of plans for new work. He was enthusiastic in discussing new expeditions in the far west, and full of reminiscences of travel and adventure. Though sixty-six years of age, we little thought then that our friend's wanderings were so near an end.

Charles C. Parry was born in Admington, England, on August 28th, 1823. His family emigrated to America nine years later, and settled on a farm in Washington County, New York. Dr. Parry was educated at Union College, and then studied medicine. He was interested, however, in botany even at this period of his life, and although he practiced his profession for a short time in Davenport, where his family removed in 1846, he soon abandoned it for the more congenial pursuit of natural history. He had devoted much attention to collecting the plants of New York before he moved to Iowa, and these studies secured for him the acquaintance of Dr. John Torrey and Dr. Asa Gray. Their acquaintance confirmed his taste for botanical exploration and exerted a powerful influence upon the remainder of his life.

Dr. Parry's real work as an explorer began in 1849, when he was attached to David Dale Owen's survey of Wisconsin, and made a collection of plants in the valleys of the St. Croix and St. Peter Rivers. The next year he joined the botanical staff of the Mexican Boundary Survey, and crossed the California desert from San Diego to the mouth of the Gila River. This journey and the subsequent ones which he made as a member of the survey, and which extended through two or three years and carried him overland from the Pacific Ocean to the Gulf of Mexico, were rich in botanical discoveries of the most interesting character. These are found recorded in the "Report of the Mexican Boundary Survey," published in 1852. Persons who cross these deserts now in Pullman palace cars can form a very slight idea of the sufferings and hardships of these early explorers, who passed months in traveling distances now covered in as many days.

Dr. Parry's next conspicuous service to American botany was performed in 1861, when he began his examination of the flora of the central Rocky Mountains. This work, undertaken mainly at his own expense, occupied him several years. The Colorado mountains were at that time a fresh field, practically, their flora being known only by the scant material brought back many years before by the naturalist of Major Long's expedition, and Dr. Parry was able to reap a rich harvest from the plants which extend to the summits of the alpine peaks, which he was the first botanist to reach. He made, too, at this time, valuable meteorological and topographical observations, afterward elaborated by Dr. Engelmann. Dr. Parry was appointed in 1869 as Botanist of the Agricultural Department at Washington, and occupied this position for two years. He was, however, an explorer by temperament and by habit, and he had little liking for the restraints of an office position. This taste for travel he was able to gratify for the last twenty years, during which he was more or less continuously in the field, either in Nevada and Utah, where he made many discoveries, or in Mexico and California, where much of the last part of his life was passed. He always kept his home, however, at Davenport, in whose Academy of Natural Sciences he was deeply interested. This he made, several years ago, the depository of his herbarium, which was, of course, exceedingly rich in western plants, and which, besides his own collections, contained those of many correspondents.

Dr. Parry discovered hundreds of new plants afterward described by Dr. Gray and by Dr. Engelmann, and his name is so firmly fixed in this way in the history of American botany that, although he published very little, it will be remembered as long as the plants of western America continue to interest the students of botany. Horticulturists will not forget that it was Dr. Parry who discovered *Picea pungens*, the beautiful Blue Spruce of our gardens; *Pinus Engelmanni*, *Pinus Torreyana*, *Pinus Parryana* and *Pinus aristata*; nor that it was through his zeal and enterprise that many plants now familiar to us were first cultivated. With Dr. Parry there passes away the last, with a single exception, of the remarkable group of men who became prominent as botanical explorers soon after the great addition to the territory of the United States which followed the close of the Mexican War, and who, fired by the enthusiasm of Asa Gray, opened to the world under his guidance the botanical treasures of the western and south-western parts of this country.

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Legislation for the Adirondacks.

THERE are several bills relating to the Adirondacks now before the Legislature at Albany, which propose radical changes in the character of the forest reserve and its administration. The recommendation of the Governor that a Commission of five men be empowered to fix the boundaries of a "state park" consisting of from 2,500 to 5,000 square miles, seems to meet with little favor, and a bill presented by the Speaker of the House, and embodying in the main the Governor's plan, has been practically withdrawn. Another bill, authorizing the establishment of such a reservation under the direction of certain citizens named in the bill, has been presented in the Assembly, but it will probably fail.

At this time it seems probable that Senator Sloan's report on the Governor's plan, which has already passed the Senate, will be concurred in by the House. This resolution empowers the present Adirondack Commission to consider the project of a so-called park to include the lands about the head-waters of the main streams which take their rise in the wilderness, and report on its size, location and probable cost. It is evident that there is no salvation for the woods unless the state acquires absolute title to them, and preparation for such purchase should be made without delay, but it should be remembered that ownership by the state in fee simple is not of itself a guarantee that the wilderness will be safe. One of the proposed park bills, for example, contemplates the leasing of its lands by the state in lots of twenty-five acres, and this provision would mean absolute ruin to the forest.

No legislation will be satisfactory unless it is based on the principle that the first and only sufficient reason why the state should hold a great tract of land within its borders is that it is essential that this particular region should remain forest-covered always so that the flow of the great water-ways of the state need not be impaired. The ruin of the Adirondack forests means the ruin of our rivers, and it is impossible to secure the preservation of the forests

for all time unless they are controlled by the state working under a permanent policy. All other questions regarding the North Woods are unimportant in comparison with that relating to the water supply. It is very well to have a sanitarium, and it is proper that people should be able to enjoy the refreshing contact with wild nature; but, after all, these are secondary considerations.

Again, if the forest is to remain and reproduce itself for all time, the fewer people who live within its borders, besides its custodians, the better. If the state acquires a large area it will be necessary, of course, to establish, at convenient points, public houses for the protection and entertainment of visitors. But this is a different thing from leasing the state land to individuals. If one man is entitled to a good site on a lake-shore for a fancy camp or a summer villa, the privilege cannot be denied to his neighbor without injustice. No matter how wild and picturesque these people intend their summer homes to be. Each one clears a little and burns a little more, and the forest, as a forest, is doomed. It is only necessary to examine the neighborhood of Paul Smith's to learn what settlement in the forest can accomplish in a very short time.

The two immediate dangers which threaten the North Woods are (1) the extension of railroads into the wilderness, for a railroad through a forest means its extermination; and (2) the legalized use of the woods as the summer homes of wealthy men. Any enactment which does not recognize and guard against these dangers will fail to accomplish its highest purpose.

The hard pine of the south, although the supply has generally been regarded as practically inexhaustible, as the supply of white pine was considered inexhaustible a few years ago, seems to be in danger of exhaustion much more rapidly than was supposed possible ten years ago. The demand for lumber of this description is increasing all over the world, and more and more of our hard pine is sent every year to Europe, South America and Australia, while the home consumption is doubling every few years. The saw-mills of the Southern Pine-belt are now kept running to their utmost capacity, and new mills are projected in all directions. The amount of this lumber exported last year from the United States exceeded the amount exported during the previous year by about forty per cent., while Great Britain took an excess of more than fifty per cent. over her importations of the previous year. It is believed that the output of the hard pine mills will be this year much greater than it was last, and that prices are to be considerably higher.

There is still a very large amount of this timber left standing in the Pine forests which extend along the coast from North Carolina to Texas; and there are still regions in which the sound of the axe is still practically unknown. The southern pine forests, however, are encroached on more seriously every year by the manufacturers of turpentine, who destroy a vast amount of timber with very little profit to themselves. But the real danger in the situation is that these forests of Pine are nowheres reproducing themselves. It is the custom, dating from before the time of the coming of Europeans to America, to burn over every spring the whole territory covered by these forests for the purpose of improving the scanty pasturage which is found among the trees, and this burning, renewed year after year, has destroyed all seedling trees, and so changed and deteriorated the character of the soil that it cannot produce again timber of commercial value. The situation is briefly this: The consumption of hard pine is increasing in a remarkable and unexampled manner. Reproduction is at a standstill. It can only be a matter of time, therefore, when the commercial importance of the Pine-forests of the south, which once contained, and perhaps still contain, the greatest body of accessible building timber of the very highest class the human race has ever seen, will be a thing of the past. No

other Pine forests produce such valuable material, and it is not very evident where the world is to find a substitute for our southern hard pine.

The number of books which have been written on the art of landscape-gardening since the arrangement of gardens and of pleasure-grounds was elevated by the poets of the seventeenth and eighteenth centuries to the rank of a fine art appears surprisingly small, when the attention to everything relating to country life, especially in England during the last two hundred years, is remembered. It is not less surprising that this literature is so generally overlooked, and so little known by the very persons who would be expected to be most interested in it, and that no serious effort has yet been made by any of the great libraries to form a complete collection of books relating to the history and arrangement of gardens. There is, however, a re-awakening of interest in the landscape-gardening art, especially in this country, where there is now every indication that its principles are to be more generally applied than they have ever been before, not only in the construction of the parks and pleasure-grounds which are springing into existence in the neighborhood of all the great centres of population in the United States, but in the more prosaic, but not less useful, arrangement of towns and villages, to which the trained landscape-gardener can bring the health, convenience and beauty which will add so much to the material welfare and development of the American people. As the knowledge of the art increases and the importance of its relations to a civilized people comes to be more generally understood, the interest in this literature, which contains a few works of cardinal value, and several of great mechanical beauty, will increase. It is desirable, therefore, that as complete collections of these books as it is possible to secure should be found on the shelves of our principal libraries, that those who practice the art, and those who study its principles, may have it within their power to learn all that books can teach them on the subject. With this view in mind, and for the purpose of aiding librarians in a search for books relating to the garden, we have obtained the permission of a correspondent to print the list of publications which have appeared on the art of landscape-gardening since Bacon first defined its scope and aims. The list has been prepared under exceptionally favorable circumstances, and is much fuller and more complete than any bibliography of the subject which has appeared. That it is not complete, however, there is probably little doubt, and corrections and extensions are asked for, in the interest of fuller information upon a subject of much literary and artistic importance.

Some Old American Country-Seats.—IV.

CLERMONT.

NEW ENGLAND, in the old days before the growing up of the great cities, possessed many towns in and near which dwelt people of polite cultivation and polished manners, whose sober, but often stately, mansions yet remain. In the seaboard towns especially, such as Portsmouth, Newburyport, Salem and New Bedford, still stand numerous examples of this appropriate urban architecture, substantial buildings, with light and some space about them, and sometimes a court-yard enclosed by a high wall in the English fashion. At Kittery, at New Bedford and elsewhere, not to speak of numerous, but fast disappearing, examples near Boston, mansions of this character may be seen standing well out of town in small parks of their own. It should be noted that the three old Bostonian country-seats, already described in this series of brief papers, have been chosen only because of their exhibiting more than usual breadth of landscape-setting, combined with more than usual excellence of general design.

Passing now from New England to New York, from the region of small hills and ponds and streams which surrounds Boston to the prospect-commanding banks of the broad Hudson, and again selecting ancient country-seats which excel in point of design, we come first to Montgomery Place, at Barrytown.

Barrytown is itself but a very small village, about ninety

miles from New York and some fifty from Albany, and it is so surprising to find here an old seat of the first class, that this number of the series must be devoted to an explanation of the fact. The Hudson River naturally attracted settlers very early. The Dutch established a trading-post at Beavercreek even before they built their fort of New Amsterdam, and here the Van Rensselaers held sway as Patroons during many years. After the English gained possession of the country, and renamed the chief towns New York and Albany, the river-lands began to be parceled out among such persons as applied for them and could persuade the Indians to sell their hunting-grounds for coats, hatchets or beads. Among others who thus obtained a manor was Robert Livingston, an immigrant of 1674, son of a clergyman who had been exiled to Holland for non-conformity. This gentleman married the widow of the Patroon, and was made lord of the manor of Livingston in 1685 by Governor Dongan, who granted him title to 150,000 acres with a frontage of about fifteen miles on the east bank of the Hudson River, opposite the Catskill Mountains. After a younger son of his, also named Robert, had distinguished himself by frustrating an Indian plot, he set off the southern part of his ample domain beside the river, and gave it to this son, making him lord of a new manor, which he named Clermont. The Clermont manor-house stands intact, its stout walls having survived the fire set by British raiders just before Burgoyne surrendered in 1777. It is approached by a long winding road, which descends from the highway through a wild woodland. Near the house the road divides to send a branch to the kitchen-door and to the stable, and the main road ends with a turn placed most unfortunately between the house and the river. The house is a square building with two low wings, and stands on a natural terrace within half a stone's throw of the low bluff which here makes the river's shore. Immediately behind it rises a bank of forest-trees, the edge of Clermont Woods, and before it, in an irregular row on the brink of the bluff, stand a dozen huge Locust-trees, doubtless the ancestors of many others which adorn the numerous Livingston properties along the river. One of these great trunks measures six yards in circumference, and shows to this day the marks of British cannon-shot.

From Clermont a short walk southward through an avenue of tall and crowded Locusts brings one to another and more elaborate mansion, situated upon the same natural terrace, backed by the same hanging woods, and commanding the same view of the river and the Catskills. This house was built by that Robert R. Livingston who was a delegate from New York to the Congress of 1776, and became first Chancellor of the State of New York, Minister to France and a patron of Robert Fulton. The ground plan of his house is in the form of an H. The central hall in the middle of the H is entered from either court; and a long corridor, which looks on the river court, and is hung with family portraits, connects the drawing-room in one wing with the dining-room in the other. The external walls of the house are white, the great rooms in the low wings have long windows opening nearly to the ground, and the two stories of the central block are crowned by an elaborate white railing. Across the ends of the wings and the river court extends a platform at which carriages may draw up, and a carriage-road makes a rectangle about the whole house. A more interesting example of domestic architecture in the formal style does not exist in America. Its owners, men who were conspicuous in the political struggles of the young Republic, were often compelled to make the long journey to New York; but they always returned to Clermont as to their one permanent home—so strong, even after manorial privileges had been abandoned, was their old English liking for country-life and country-leisure. Montgomery Place, at Barrytown, was an offshoot of these manorial seats at Clermont. Like several other old seats upon the Hudson, it would never have been created had not Governor Dongan and his superiors in England attempted to plant in America the English manorial system.

Boston, Mass.

Charles Eliot.

The California University Gardens.

ALTHOUGH the careful and constant work of Professor Hilgard and his assistants has created what is already, in important respects, a "Botanic Garden," it is modestly divided, in his reports, into the "Agricultural Grounds," the "Experimental Grounds" and the "Garden of Economic Plants." Berkeley, although exposed to the sea winds, is high above the valley, and much has been done to naturalize a great variety of plants there which are popularly supposed to thrive only in the southern counties of the state.

When the site for the University of California was to be

chosen many considerations were involved. There were valleys, east of the Coast Range, warm and well watered, that offered magnificent situations, but they were too far from San Francisco, the commercial centre. Berkeley, fronting the Golden Gate, with the Contra Costa Mountains behind it, combined the greatest number of advantages. Here, too, small but beautiful streams, flowing from deep, rocky and wooded cañons, united at the edge of the valley; here were copses of Laurel and Alder, and noble groups of Sycamore Maple and Live Oak; here was a large extent of rolling upland, sloping to the bay on the west, and rising on the east into rugged mountains. Every botanist and landscape-gardener who saw the place was charmed with its possibilities. Frederick Law Olmstead was asked to make a plan for the University grounds and the adjacent town. This plan was subsequently stolen or destroyed, and every effort to secure capable landscape-gardening was for some time frustrated. A man who had millions of *Eucalyptus globulus* seedlings managed to sell several hundred thousand of them to the University authorities, and they were planted everywhere. Instead of the garden art that every educated Californian wanted to see, Berkeley became for years a wilderness of tall, crowded Eucalypti, and all its natural beauties were obscured. A broad avenue winding about the base of the hills for miles, which had appeared in Mr. Olmstead's plan, was almost entirely lost. Even the town yielded to the prevailing Eucalyptus craze, and soon rivaled the University in its stiffness.

The great Oaks were still left below the University building and along Strawberry Creek, and, ten years later, as wiser counsels prevailed, the Eucalypti were thinned out and left for a background and for occasional masses on the hills. Part of the warmest ravine and plateau south of the main creek had been sold, unwisely, and against the advice of those who wished to see a botanic garden established. But at the north side of the University tract was a low hill-slope, with southern exposure, and a few acres of rich bottom-land along the creek below. Here propagation houses were built, and the long task of substituting valuable and beautiful plants for the foolish monotony of surplus Eucalyptus-trees was begun by the Agricultural Department.

The evil of the past is now nearly obliterated. English and other Oaks form one plantation. Some of the most beautiful Australian Acacias are grouped among the California conifers. Sheltered south of a belt of Live Oaks are Palms in great variety, and there are great masses of Bamboos. The experimental orchard and vineyard are on a hill-slope, with the economic garden south-west on the plain. Steadily, persistently, the work of covering the hundred or more acres of available land with rare and valuable plants goes on under Professor Hilgard's supervision.

My own memories of the University gardens go back to 1876, when I used to spend Saturday afternoons in the plant-houses helping a good-natured gardener, and taking my pay in seeds and cuttings of whatever happened to strike my fancy. It was an amateur sort of a place in those days, however, with very little that the florists did not have, and no system worth mentioning. The most brilliant event of that decade was to plant thousands of white and red Mesembryanthemums on the hot hill-slopes and around the University buildings, which the irreverent students presently named "Faculty Onions," and laughed to scorn, rightly preferring turf, or even Wild Oats.

By 1880, after the work of propagation had been well systematized under the direct supervision of Mr. W. G. Klee, a great many valuable trees and shrubs were distributed over California besides the specimens that found place in the grounds. Among them were five species of Cinchona—*C. Calisaya*, *C. succirubra*, *C. condaminea*, *C. officinalis* and a hybrid from India.

The winter of 1887-88 killed all the Cinchonas, although *C. officinalis* and the hybrid had withstood all former winters by means of slight protection, and were nearly ready to bloom. All the distributed trees, excepting those at Mrs. Whitney's, San Diego, also died. The regions in this state adapted to this tree are evidently limited. The warmest mesa lands of the extreme southern part of the state promise a moderate success.

The Carob (*Ceratonia Siliqua*) is quite hardy, as is also the Caper (*Capparis spinosa*). The Japan Vegetable Wax (*Rhus succedanea*), also *R. vernicifera*, are free growers and ornamental, and, with the *R. Coriaria*, perfectly adapted to California. *Anona muricata*, the Sour Sop, was a failure, and *A. Cherimola*, only suited to greenhouse culture at Berkeley, thrives in the southern parts of the state. The Tamarind-tree is very tender and a slow grower. Among other trees planted and doing well are the *Argania Sideroxylon* of north Africa, and the *Berberis heteropoda* of Turkistan.

The experiments with Oaks deserve especial attention. The eastern species, such as *Quercus nigra*, *Q. coccinea*, *Q. alba* and others, are slow growers. The English *Q. Robur* is a great success, surpassing in rapidity of growth all other sorts two or three times over. Acorns planted in 1878 are now large trees. This species of Oak is recommended by the University for planting in all parts of California. The Cork Oak has been distributed for the past two seasons, and reports indicate its adaptation to a very large area, but more especially to the foothills of the Sierra Nevada.

The growth of the Wild Cherry (*Prunus serotina*) and of the Box Elder (*Negundo aceroides*) has been all that could be desired, but the two Hickories tested, *Hicoria glabra* and *H. alba*, have been extremely slow, and will not pay to plant here. A Japanese tree, the *Zelkova Keaki*, makes a fine growth.

Since 1880 the work of the University gardens has been broadened in many directions. Carob-trees sent out are growing in Napa, Colusa, Los Angeles and other parts of the state. The largest Carob-trees in California are near Los Gatos, on the farm of Mrs. Arnerich, the widow of a Dalmatian who planted seeds in 1873 producing some twenty-five trees, now fifteen feet high, with trunks nine inches through. Trees of equal age, though not so large, are in bearing on the farm of James Shinn, Niles. The Carob seems to be perfectly at home on the California hill-sides.

The yellow Guava, *Psidium pyrifera*, only succeeds in sheltered spots in the southern counties and in the Sierra foothills. *P. Cattleianum* proves hardy at Berkeley, on the Oakland foothills, and in many places throughout the state. The Melon-tree (*Carica Papaya*) failed in most places. At last a small plant was sent to Mrs. Whitney, of National City, San Diego, and in three years it grew to a height of twelve feet, and has borne fruit every season since. The Pistachias, both *Pistachia vera* and *P. Terebinthus*, are being planted in many places. The latter grows rapidly and is hardy; the former is a slow grower, but promises well. The largest in the state are at Niles.

The Camphor, *Camphora officinalis*, is an entire success. On the Hayward estate, San Mateo, are trees forty-five feet high, with trunks three feet in diameter. The Camphor thrives here wherever a Peach or Pear will grow, and hundreds of trees are now planted on every kind of soil. It promises to become one of the great avenue trees of the future. One of the Cinnamons, the *Cinnamomum glaucum*, seems to be as hardy here as the Camphor.

Among the rare Chilean shrubs growing at the University are the handsome-leaved *Boldoa fragrans*; the *Persea lingua*, whose timber is used for cabinet work; the thorny hedge plant, Espino, and the *Psoralea glandulosa*, which is used to some extent for planting on drifting sands. The Acacia that has been most widely distributed is the *A. decurrens*, or Black Wattle, which proves of rapid and easy growth from Shasta south. *A. dealbata* and *A. melanoxylon* are equally fast growers. The only possible objection to the Acacias is that the forests are liable to become infested with the Cottony scale. Mr. Klee tells me that since the introduction of the Australian Lady-bird, which feeds on the Cottony scale, he considers all danger to the Acacias from this source over, and thinks they cannot be recommended too highly. The famous Jarrah, *Eucalyptus marginatus*, is hardy in many places about Berkeley.

Of Olives, two valuable varieties introduced by the University from Spain are the Manzanillo and the Nevadillo Blanco. They have been widely distributed, the latter proving the most vigorous grower of any Olive yet in the state, although perhaps not so hardy as some others. A number of varieties of Mulberries, including the best Japanese, have been distributed at the various stations. They have done remarkably well. At Paso Robles they have resisted the hot and dry weather better than any other deciduous trees.

The Huasco raisin Grape, from Chili, has been distributed widely, and during the last two years has fruited in many parts of California. In appearance it seems impossible to distinguish it from the Muscat of Alexandria, but it shows less tendency to "coulure" in localities where this is caused by the northers, and hence may prove more valuable in certain regions.

Of new hardy Palms, the *Erythea edulis* is an attractive Pacific Coast species, similar in growth to the *Washingtonia filifera*, of a darker green, and without filaments. It has proved as good a grower and fully as hardy, having fruited for the past two seasons at Berkeley. The Chilean Coquito (*Jubaa spectabilis*) is much like the true Date Palm in appearance, but is of a more robust habit, and a darker green. It is also hardy here, and exhibits in Berkeley fully as good a

growth as the Date. The *Acacia Arabica*, one of the sources of gum arabic, was grown from seeds imported from India, and was distributed both in the form of seed and plants. The only place where it survived the severe winter of 1887-'88 was on the mesa land of San Diego County.

The New Zealand Flax, *Phormium tenax*, has been distributed throughout the state, and finds great favor with many gardeners for tying purposes. It does not thrive in the hot interior valleys, but in the Coast Range-region it is an entire success. In fact, I have seen it growing in cañons where roots have been thrown from gardens, and it is likely to become naturalized in some localities.

The University has devoted a good deal of time and money to experiments with new forage plants, medicinal plants adapted to the climate, and new fruits. E. J. Wickson made a valuable report on the grasses and forage plants in 1887, in which he said that this department began in 1879 with about fifty species of grasses, clovers and other plants, and had added all the promising species that could be obtained. The seasons of 1888 and 1889 were "dry years," and the conclusions of the previous years were confirmed. *Sorghum Halepense*, the evergreen millet, needs irrigation, will stand little frost, and has generally proved disappointing. Two Brome grasses, *Ceratochloa unuloides* and *Bromus inermis*, have been widely distributed with great success on hill lands. Of the Australian Salt Bushes recommended by Baron Von Mueller, *Atriplex vesicarium* and *A. nummularium*, the latter proves superior. It grows on salt marshes and affords much fodder. The Tegasate of the Azores, *Cytisus proliferus*, is a very pretty shrub, six to ten feet high, but its value for live stock is as yet unsettled.

The native grasses, clovers and forage plants of the Pacific coast are being tested under cultivation as fast as they can be collected. This is probably the most promising field at present. Only the old pioneers, who remember California and Oregon as they were when first settled, can form any idea of the waste wealth of pasture. Intelligent cultivation ought to restore the worn-out hill pastures of this region. In the years following a great rainfall, such as the present winter, species of native grasses and flowering plants that one seldom sees are abundant on the California hill-sides. The coming summer will afford an excellent opportunity to secure seeds and roots.

Niles, Cal.

Charles H. Shinn.

Viburnum pubescens.

Viburnum pubescens, figured on page 125, is one of the handsome North American shrubs which is not at all new from the point of view of science, but about which gardeners know very little, and no portrait of it has been published before except a small figure in a Danish scientific periodical practically inaccessible to the great majority of students.

Viburnum pubescens is, nevertheless, one of the best garden plants of its class. It is a compact shrub, growing in cultivation to the height of three feet or a little more, with rigid, erect branches covered with bright colored, reddish brown bark. The leaves are ovate, taper pointed, remotely and sharply serrate, except near the base; they are conspicuously pinnate-veined, two to three inches long, an inch or so broad, and are borne on short, broad petioles. They are covered, on the under surface, as are the young shoots, with a short and very soft pubescence; and in the autumn they turn to a peculiar dark and very rich purple color. The small flat cymes of white flowers, produced in great profusion, unfold in June, and quite cover the upper branches of well cultivated plants. The fruit ripens early, in September or even in August sometimes; it is very dark purple or nearly black. The drupe is oval, a third of an inch long, and slightly flattened before it is fully grown. The seed is slightly furrowed on the two faces with narrowly incurved margins.

Viburnum pubescens is widely distributed from Lower Canada to the Saskatchewan country; it is rather common in northern New England, extends westward to Illinois, and has been found as far south as Stone Mountain, in Georgia. It is rare at the south, however, and is a real northern plant. It resembles in general habit the better known *V. dentatum*, except that it is smaller in all its parts; and it was formerly considered a pubescent variety of that plant, from which, however, it is now distinguished by its flat drupes and seeds and by its short-petioled or nearly

sessile leaves. The fruit, too, is much darker colored, and it ripens earlier, while the color which the foliage assumes in autumn is entirely different from that of all our other *Viburnums*.

The autumn coloring of the leaves of this *Viburnum* constitutes its principal value as a garden plant, and makes it a very desirable addition to the shrubbery, where the unique tints it assumes in October make it always a most conspicuous and interesting object.

C. S. S.

Foreign Correspondence.

London Letter.

Fragrance in Ferns has lately been the subject of much discussion in the London papers, largely by people who appear to know little about it. We have not yet reached the point of starting a limited liability company to turn this property in Ferns to profitable account, although leader-writers in some of the morning papers evidently think there is a "good thing" in this—to them—new discovery. At a meeting of the London Botanic Society, the Secretary drew attention to the strong, hay-like odor of a Fern which he called *Polypodium Wildenovii*, but which afterward proved to be the commonly grown *P. Phymatodes*, the fragrance of which is well known to pteridologists. The odor is emitted by the fronds of this species when they are partially dried, and even after they have been dried for years. A few of the fronds, when placed in a room, impart to it a very pleasant, hay-like odor; or they may be used for placing among linen, etc. The plant itself is not in the slightest degree fragrant; it is only after the leaves have begun to "flag" that the odor is developed. There are several other species of *Polypodium* belonging to the same section as *Phymatodes* which also possess this peculiar character. They are employed by the South Sea Islanders and by the Maories in New Zealand to scent oils and various foods. It is possible they may prove of some economic value here; at any rate they may be used in preparing *pot-pourri*.

Other fragrant Ferns known here are *Dicksonia punctiloba* and *Nephrodium fragrans*, both natives of North America and both sweetly scented, the latter resembling Primroses in its odor. Then in England we have *N. æmulum*, called also *N. Fenisecii*, or "hay cutter," on account of its hay-like odor, and *N. montanum*, which smells like lemons. Another fragrant *Nephrodium* and a well known greenhouse Fern here is *N. patens*, the fronds of which when bruised emit a strong odor like that of ripe apples.

Although not fragrant, yet deserving of mention because of its strong and peculiar odor, is a variety of *Anamia Phyllitidis*, a common Fern in South America and the West Indies. As a rule this species is odorless, but I am informed that in Jamaica a variety occurs with a strong and very disagreeable odor. The development of this character in only a small proportion of the plants of a species is very remarkable. There is absolutely no other character by which the variety here called *Fœtida* can be distinguished from the type, except that of odor.

Seeds of Sugar Cane.—Two years ago attention was called to the question of how far it was possible to improve on the saccharine qualities of the Sugar Cane by other means than selection from bud variation, the plan invariably adopted by cultivators of this plant. It was then stated that "owing to the power of producing fertile seeds having apparently been lost by the Sugar Cane, it was impracticable to deal with it by means of cross-fertilization or by the ordinary course of seminal selection." This statement now proves to be incorrect, seeds and seedlings having been produced by Sugar Canes in Dodd's Botanical Station at Barbadoes. A quantity of the seeds have lately been received at Kew, and young plants raised from them. Apparently, therefore, the Sugar Cane still possesses the power to flower and mature seeds if placed under conditions favorable to its doing so. The importance of this discovery cannot easily be exaggerated, and there is now a hopeful prospect of a considerable improvement being made in the sugar-yielding qualities of the Sugar Cane, which, if realized, will strengthen the producers of cane-sugar against those of beet-sugar. That variation does actually occur amongst plants raised from seeds is proved by a letter from Mr. J. B. Harrison, of Barbadoes, to the Director of Kew (See *Kew Bulletin*, December, 1888, p. 294), in which he states that "sixty [seedling] plants were successfully transplanted and are being cultivated. At present they are not far enough advanced in their growth to speak with

certainly, but there appear to be amongst them several different kinds, probably five or six at least." A description of these six seedling varieties has lately been published in the *Demerara Garden, Field and Forest*, and they are spoken of as very promising. The Director of Kew has recommended the whole subject to the consideration of the Colonial government, suggesting that experimental cultures of the Sugar Cane should at once be started in Demerara, Jamaica and other sugar-producing colonies. The belief that the Sugar Cane never produced seeds also exists with respect to several other cultivated plants, two of them being natives of New Zealand, namely, *Convolvulus chrysorrhizus*, the Kumara of the Maories, the tubers of which are a staple food with them, and the Ti plant, a species of *Cordyline*. The former plant used to be in cultivation at Kew, and one year it produced tubers

English market. The French apples in the market now are remarkable for their bright, attractive colors, and they fetch about from twelve to sixteen shillings per hundred-weight, wholesale. The American samples vary in quality, the poorest selling for twelve shillings, the best for about twenty-five shillings per barrel. They are chiefly Greenings and Russets, the latter commanding the highest prices. Good grapes sell for as much as five shillings per pound. Oranges are abundant and cheap. Pecan-nuts from America have lately appeared in the London shops, and they promise to become almost if not quite as popular as their allies, the Walnuts. They are, however, not yet much known. The Shell-bark Hickory-nut also has been tried, but it is a very inferior nut and scarcely likely to find favor here.

Vegetables are abundant and good, the mildness of the win-



Fig. 26.—*Viburnum pubescens*.—See page 124.

which were quite as good as Parsnips, when cooked. They are, however, difficult to keep through the winter, and they were consequently lost.

Fruit and Vegetables in the London Market.—A few notes on these at the present critical season of the year may be of interest to some of your readers for purposes of comparison. With regard to fruit the supply is unusually poor, even for February. Pears are not to be had, while apples are rather scarce, what we have being either American or French, a few only being English, principally of Dumelow's Seedling, an Apple of first-rate quality and usually plentiful at this time of year. It and Bramley's Seedling, a very similar kind, are placed in the first rank and strongly recommended for orchard planting, the last named being spoken of by one of our first authorities, Mr. Wright, as superior to most of the apples grown for the

ter having been in the favor of growers, although the abundance tends to keep the prices exceptionally low. We have still Brussels Sprouts; Broccoli, chiefly from Cornwall, is plentiful and sells for about five shillings per crate. Kale and Sprouting Broccoli are also good and cheap, the last named being obtainable for one shilling per sack, the price of Turnip-tops, a popular vegetable here with the poorer classes. Savoys, bunched greens and Spinach are almost given away, the last named not commanding more than one shilling six pence per bushel. Potatoes are mostly of the following kinds: Beauty of Hebron, an excellent potato both for early and late purposes; Magnum Bonum, Early Rose, Regents, Scotch Champion and Emperor. These are more or less abundant, and vary in price according to quality from forty to seventy-five shillings per ton, a few specially good samples of Magnum

Bonum and Beauty of Hebron fetching as much as ninety-five shillings per ton. Asparagus fetches from eight to ten shillings per bundle of one hundred sticks. Tomatoes are now received from the Canary Islands in considerable quantities, and these are cheap enough and of sufficiently good quality to destroy the market for English grown fruit, which, a little while ago, sold for high prices at this time of year. Now, however, it is possible here to get a dish of tomatoes for six pence per pound retail. Except where otherwise stated all the prices here quoted are wholesale. I am indebted for most of the particulars here given to a paper by Mr. Shirley Hibberd in the *Gardeners' Magazine* of to-day.

London, February 22d.

W. Watson.

Cultural Department.

The Cucumber.

THIS is a much more interesting study in a botanical sense than the Watermelon, and has a greater climate range than the Watermelon or Cantaloupe. It is eaten young as a pickle, older as a salad, and may be cooked at maturity like a squash. Each country appears to have its special varieties, some of which are not edible; others are actually poisonous, and others again are eaten with relish undressed.

The fruits vary in length from less than two inches to six feet, and from an ounce to twenty pounds in weight. Their prevailing color is green; but there are also white, yellow, pearl color with green stripes, and striped green and white varieties. In form they are straight, curved, tortuous, cylindrical and prismatic; with smooth, hairy, prickly, spinous and knobbed surfaces. Some are full of spines when quite young, and others like a hairy caterpillar; but both kinds become smooth as they mature.

Hairy Cucumbers are the favorites of Egypt and Syria, where they are eaten in vast quantities, as our people eat apples, without any preparation or even paring. In India they are used for pickling. We have tested two varieties from Cairo, and one from Beirut. One of the Cairo varieties is long, drupe-shaped, of a delicate pearl green tint, and has ten bright green lines running from end to end in shallow grooves; it is a beautiful looking fruit. The leaves of the plant are three-lobed and of small size; the fruit is known in Egypt as the Quaté. The other Cairo variety bears a curved fruit of much less attractive appearance, and the leaf is scallop-edged. The Syrian hairy Cucumber is known by the native name of Mukte, and is considered the best in Palestine, where they grow also pure white fruits, and green ones that turn lemon-yellow at maturity. The Mukte somewhat resembles the Quaté, but has the green lines only at the ends; its leaves are of the form of a Palm-leaf fan, and the plant looks more like a Cantaloupe than a Cucumber-vine. The natives eat this cucumber in quantities, skin and all, and American residents claim that it is much more wholesome than any of our varieties; when grown climbing it is a beautiful fruit, but is apt to grow hollow in our soil and climate.

The reticulated Cucumber has within a few years become well known by its sponges, sent as a commercial product in bales from Japan and Egypt. The first sold here was the product of the wild variety of Cuba, which grows very small in that island, but larger in Florida and in this city. The Cuba sponge is very fine in texture and only about eight inches long; it is used by Florida ladies for washing their hands.

The Chinese and Japanese have the largest of the Cucumber family, the fruits being very thick in proportion to their length. Seeds of the Chinese variety were sent to me under the name of a long, green Squash, by a correspondent at Foochow. I at once found that the fruit could not be a Squash, and was curious to find out what the peculiarly formed seeds would produce. The plant proved to be a Cucumber-vine of large proportions, having a leaf like that of the White Spine, but larger. The fruit is large and green, and would be taken for a Squash, which it tastes somewhat like when cooked; it hybridizes readily with our Cucumber, which ruins the product of the seed.

The *Benincasa cerifera* of India is an intermediate in character between the large Chinese Cucumber and a Watermelon. The vine is somewhat like that of a Squash, and the young fruits are covered with hairs; the seeds are white, very light in weight and abundant. The fruit looks like a Watermelon covered with a white coating like the bloom upon a blue plum, but much thicker; it is sometimes called the "Waxed Squash" and is prepared for the table by stewing; the seeds are much more like those of a watermelon than of a squash. The fruit has

been grown at Reedland Farm, New Jersey, and bears our climate well; I do not know that it has been cooked in this country; in India it is served at weddings.

Prompted by a remark made by an Armeno-Turkish lady, I sent to Constantinople and obtained in 1883 the seeds of a green cucumber, to which I gave the name of the "Pera," and which I believe to be the largest and finest flavored variety ever introduced into America; and this appears to be the opinion generally held in regard to it. I also obtained seeds of the White Cucumber of Palestine, and the prolific Green Cucumber of Malatiyeh, in the valley of the Euphrates, both of which were fully tested, and the former of which is considered a valuable acquisition for quality and productiveness. —From an address before the *Pennsylvania Horticultural Society* by Robert T. Harris, M.D.

Wire-Netting in the Kitchen-Garden.

PEAS, Climbing Beans and Tomatoes are all better for some support, and with most village-gardeners Bean-poles and Pea-brush cost money and trouble. At best, the brush and poles are unsightly. Some months ago I recommended the use of the galvanized wire-netting, now sold so cheaply for this purpose, and I have just seen the suggestion ridiculed in an agricultural paper as a device for millionaires. Now the fact is, that the galvanized wire-netting, sufficient for a row of Peas, Beans or Tomatoes 150 feet long, will cost twenty cents a year if ordinary care is taken with the netting when not in use. To go into the country, cut and haul brush enough for such a row would cost the average town gardener five times as much at least. In fact, I believe that in a farmer's garden even it will be more economical to use the wire than to take time to cut and haul the brush. In using the wire only a few stout stakes are needed, which can be put away under cover when not in use, and it makes the neatest kind of a trellis imaginable. It throws no shade and always presents a point to tie to. Tomatoes usually need a good deal of tying with most methods of training, but on the wire-netting they soon get their shoots interlocked in the meshes and only need the occasional tying in of a branch. This netting is not only cheaper than the various patent trellises offered for sale, but is much better every way. The netting is largely used for poultry-yard enclosures. A wider grade is used, so as to make a fence seven feet high by the help of a base-board twelve inches wide. There is no reason why these poultry-yard fences could not be made both beautiful and useful by using them to support Grape-vines, trained high, so as to have the fruit out of the way of the poultry. The vines would be benefited by the dropping of the fowls, and the fowls by the shade of the vines. I have often thought the hideous wire fences, which are now getting so common, could be made more useful as fences and at the same time yield a revenue by planting some of the improved Blackberries beside them and tying the shoots to the wires. I saw one recently covered with a dense growth of evergreen Honeysuckle, and it was about as pretty a hedge as one would wish to see. One of the beautiful sights of this city is a wire fence dividing two lawns, which is covered with well trained *Maréchal Niel* Roses. Northward a more hardy Rose could be substituted.

Raleigh, N. C.

W. F. Massey.

Beaumontia grandiflora.

BEAUMONTIA is a small genus of stout evergreen climbing shrubs with large leathery green leaves and terminal cymes of large, trumpet-shaped, white, fragrant flowers. It belongs to the same natural order as *Dipladenia* and *Allamanda*, namely, the Dogbanes, and with them forms a trio of free-flowering stove plants of exceptional size and beauty. But whilst the two last named genera are cultivated in almost every good garden, *Beaumontia* is scarcely known. The largest flowered species is *B. grandiflora*, and it is to this that we wish to direct special attention now.

It was first introduced into England by Dr. Wallich in 1818 from the Himalaya, where it extends from Nipal to Sikkim, ascending to 4,000 feet elevation. It does not, however, appear to have attracted the attention of horticulturists, and when several of its magnificent clusters of flowers were sent from the garden of Earl Cowper to a meeting of the Royal Horticultural Society, in the spring of 1886, it was almost unknown. Mr. Ruffett, gardener to Earl Cowper, has just forwarded to Kew an exceptionally large cluster of the flowers, and they are so large, so exquisite in form and purity, as well as being very fragrant, that one wishes that every garden possessed the plant which may be made to yield every spring flowers like these. Here is a description of them. Each flower resembles

in form and size the Bermuda Lily; the tube is six inches long, trumpet-shaped, two inches across at the mouth, where there are five spreading segments, each two inches long and one and a half inches wide, reflexed and pointed at the tips. The whole of the corolla is pure shining white, except at the base near the calyx, where it is slightly tinged with green. The calyx is composed of five oblong overlapping lobes, free almost to the base, one and a half inches long, green, tinged with brown. There are four fully expanded flowers, three large buds, and about thirty smaller ones in the single cymose head before me now. The leaves are ten inches long by about four inches broad, Magnolia-like in texture, dark green above, paler and tomentose beneath. The thickness of the stem six inches below the head is a half inch in diameter.

The plant grows very rapidly, and when properly treated it develops all along its main branches lateral branchlets, which, when about eighteen inches long, bear each a head of flowers. I have seen a plant which was growing in a stove, and planted in a fifteen-inch pot, with over a hundred flowers expanded upon it, and all upon a vine not more than twenty feet in length.

CULTURE.—I cannot do better than quote here the cultural directions which Mr. Ruffett sent to me a year or so ago. Speaking of the first small plant he got, he says: "I potted it in a compost of equal parts fibrous loam and peat, with a little

is something to know that this magnificent Indian plant is satisfied with our weak sunshine, provided it is left alone to make free growth in its own way."

There are three other species of *Beaumontia*, and one of them, namely, *B. Ferdoniana*, a native of the Deccan Peninsula, is in cultivation at Kew, and in a few other gardens, notably at Panshanger, where Mr. Ruffett has succeeded in flowering it this year. It is smaller in all its parts than *B. grandiflora*, and although handsome when compared with many other garden Apocynads, it is very second-rate by the side of its congener. The flowers last well when cut and placed in water. They are also suitable flowers for wreaths and bouquets. A wreath formed entirely of the flowers of *B. grandiflora* was one of the most beautiful of the hundreds sent to the funeral of the Duchess of Cambridge about a year ago. The majority of those who saw this wreath mistook the flowers for "elegant and uncommon looking Lilies."

Kew.

W.

Orchid Note.

Maxillaria lepidota.—Under this name there is a small but vigorous plant now flowering freely in one of the green-houses at the Harvard Botanic Garden. It is uncommon and interesting. Brown, in his supplement to Johnston's



Clermont on the Hudson.—See page 122.

silver sand, keeping it in active growth. When it had attained the height of three feet it was planted out at the warm end of a large conservatory, where it grew fairly well for three years, but made no sign of flowering. Feeling assured it required more solar heat to develop its growth, I had it removed to the back wall of a Banana house, which is a span roof resting on a wall ten feet high. It was now a plant considerably over twenty feet high, and in a place that rendered it difficult of access. The consequence was that it was much mutilated in process of removal; so much so that I quite despaired of success in the operation. However, the thing was accomplished, and when a year had gone by it began to make rapid growth, and had to be stopped back to prevent its overgrowing everything.

"The use of the knife was evidently not to its liking, for it still made no sign of flowering. I therefore allowed it a space under the north side of the roof to grow as it liked, and then the tables were turned, and I had my reward for humoring its nature. In the following spring, after one year of free growth only, it made a grand display of flowers, and has continued to do so, the present being the third year of its flowering with me.

"I find it a very free-flowering plant, not requiring a great amount of fire heat, but all the sun-heat and light possible. It

"Gardeners' Dictionary," states that it was introduced from Colombia in 1878. But a species under the same name was known to botanists much earlier. Lindley's description of the latter is as follows: Stemless. Leaves solitary, strap-shaped and very sharply narrowed to a petiole. Peduncle one-flowered, acutely sheathed, erect and half as long as leaf. Sepals long, linear and narrowly pointed. Petals bristly acuminate and half as long as the sepals. Lip fleshy, obovate, three-lobed, keeled at top and chaffy on both sides. Middle lobe ovate; the top and anterior margins of the lateral ones crenate. Tubercle narrow and scarcely reaching the middle of the lip.* Now, the plant under notice differs in one very important particular from that described by Lindley. The latter is stemless, while the former has very apparent pseudo-bulbs, of flattened ellipsoidal form, and from two to three inches high. The solitary leaves are borne on top of pseudo-bulbs. In all other particulars our plant conforms closely to Lindley's. As a garden plant it is very desirable. The principal fault with many species of this genus appears to be that their flowers—borne, as they are, upon short stems—are hidden by the leaves. That, however, cannot be said of this one. The leaves droop over gracefully, and the flowers, being borne at the top of long stems, are

* *Annals of Nat. Hist.*, vol. xv., p. 38; 1845.

seen to full advantage. The flowers are of an orange-yellow color. The sepals are slightly marked with reddish brown at the base, on the outside; and an indistinct shade of the latter color prevails in about two-thirds of their length, measuring from the tip. The column is freely dotted with little brown spots. Delicate markings of the same color appear at the base of the lip, on the under side, and the thick keel is tipped with a conspicuous blotch of darker tone. Both sepals and petals are sometimes curled and twisted in a manner that renders them additionally interesting. As grown here, in a pot, the plant succeeds admirably under the treatment ordinarily accorded *Maxillarias*, and flowers freely during the winter months. Mr. Watson, of Kew, will confer a favor by saying how far this plant resembles any there may be, under the same name, in the Kew collection. Acknowledgment is made to Dr. Watson, of the Harvard Herbarium, for assistance rendered in my inquiries as to the identity of this plant.

Botanic Garden, Cambridge, Mass.

M. Barker.

The Day Lily of the Desert.

ONE of the most beautiful and characteristic plants of the Desert region of California is the Day Lily (*Hesperocallis undulata*). Its flower-stems rise from one to two feet above the sand, and bear from a few to thirty or more fragrant flowers, in color, I should judge, of a pearly or greenish white, with greenish stripes. I have seen only one in blossom, and that was too far gone to show the genuine tint.

This interesting species is one of the most promising novelties of the present season, not only for its promise of furnishing us with another lovely garden-flower, but also for its probable economic value in the arid regions of the west. It produces a large edible bulb, varying from one to four inches in diameter, nearly round, with firm flesh. The bulb has a pleasant taste, eaten either raw or cooked like onions. Our party of seven have had them cooked at nearly every meal since we first tested their qualities, and in the lack of other vegetables find them acceptable.

The bulb is found from six to eighteen inches below the surface of the sand or fine gravelly soil, in which the plant thrives best, and is usually found resting on moist gravel or a clay subsoil.

It is not rare on the Colorado and Mohave Deserts, and usually blossoms on the Mohave in the month of May. Near the boundary line it bloomed in 1889 as early as February, and was in seed in April. This year only a few plants are found showing as yet any signs of a flower-stem, but a few weeks of warm weather will doubtless bring them forward.

The Indians are said to obtain both food and drink from this plant when crossing the plains. For eighty or a hundred miles along our southern border one may travel at certain seasons without finding water. The traveler is safe, however, if he knows how to search successfully for this important vegetable, and once found he need not fear either hunger or thirst.

Should it prove susceptible of easy cultivation in the arid regions of the west, it will prove a valuable addition to our list of vegetables. It will certainly prove a welcome addition to the garden, if not an acquisition to the farm. C. R. Orcutt.

San Diego, Cal.

Clivia (Imantophyllum) cyrtanthiflora.—There are now many splendid hybrid forms of this genus, but it is doubtful if any of these will, for general purposes, prove superior to the subject of this note. And, by the way, this, too, is now classed as a supposed hybrid between *Clivia miniata* and *C. nobilis*, both natives of the Cape of Good Hope. Some years ago *C. cyrtanthiflora* was also regarded as a species from the same part of the world, and it would now be interesting to know why botanists have changed their minds. It is an evergreen bulbous plant that thrives most satisfactorily in an ordinary greenhouse. The pointed, strap-shaped leaves, from one to two feet in length, are arranged in two rows, and they all proceed from the root. The erect scape is almost as long as the leaves, and bears, in the form of an umbel, from twenty-five to thirty cup-shaped flowers, which are from two to three inches long, drooping, and of a bright salmon color; they are produced at various periods throughout the year, in fact, the plant is seldom without flowers, but most freely during the winter months, and their full color and freshness are retained a great while. Established plants seldom require repotting, and they may be grown in a cool greenhouse during summer, when they should be liberally watered; in winter water may be partially withheld, and the temperature should be maintained at about sixty degrees. To increase the stock, divide the old plants after flowering; and in potting use four parts of good rich loam to two of leaf-mould and one of rough charcoal.

Cambridge, Mass.

B.

Viousseuxia Pavonia, or, as it was first called, *Iris Pavonia*, is one of those charming old-fashioned plants which has now almost disappeared from gardens. It is a native of the Cape of Good Hope, like the other species of the small genus to which it belongs, is distinguished from *Iris* by its filaments united into a tube and by its minute interior perianth-segments. It is a greenhouse plant, but requires very little artificial heat, and flowers in February in a temperature running down to forty or forty-five degrees in cold nights. A pan filled with one or two dozen bulbs is an attractive object when the plants are in flower. They have long, grass-like, pendulous foliage, and flower-stems a foot high with wiry *Iris*-like flowers about the size of silver dollars. The three outer divisions of the perianth are white, with a large, conspicuous blue spot at the base, its margin fringed with purple and marked at the bottom with two bands, the first purple and the second yellow, the whole resembling the eye in the tail-feather of a peacock—a resemblance which caused the adoption of *Pavonia* as the distinguishing name for the plant. The under side of these divisions of the flowers are beautifully marked with reticulating blue or light purple lines. The Peacock *Iris* is one of the easiest plants to cultivate successfully. The bulbs multiply rapidly, so that the stock can soon be increased, and the plants had in flower during a considerable part of the winter if they are brought forward successively in different temperatures. It is not easy to explain, therefore, why such a pretty and desirable plant should have become so rare. It was one of the first plants from southern Africa known and cultivated in Europe and several figures of it appear in the botanical and horticultural literature of the last or of the beginning of the present century. Bulbs can be obtained from the bulb-growers of Holland.

Boston.

S.

Doronicums.—Mr. John Thorpe has done well to call attention to these desirable plants for winter blooming. Some twelve months ago I wrote of the value of *D. Caucasicum* for cutting purposes, and to this should be added *D. plantagineum excelsum*, the flowers of which are often four inches in diameter. Our plants have flowered for the past two months in a house where frost was excluded. In cases where this cool treatment is given the plants do not seem to suffer in any way when planted out in spring, but flower right on through the early summer months if placed in a rich, moist soil. With us *D. Clusii* is not a success, owing to its provoking habit of rotting in the centre, by which the plant is often completely destroyed. This has been our experience during the past two years with *D. Clusii*, both in-doors and in the open ground.

Dianthus latifolius.—There are not many perennial *Dianthus*es that will flower in four months from sowing the seed, but we sowed a packet of seed of *D. latifolius* about the end of September and the plants began to flower early in the new year. In habit this *Dianthus* resembles the Sweet William (*D. barbatus*), but the foliage is much broader, and the flowers are an inch across and are produced in clusters on long stems, so that they are very useful for cutting purposes, especially so since the unopened buds expand in water. We know of no *Dianthus* with flowers of such a brilliant, rich crimson as those of *D. latifolius*. It is a desirable plant where winter flowers are required in quantity.

Passaic, N. J.

E. O. Orpet.

Italian Onions.—The introduction of this vegetable has been a great boon to all the southern sections of our country, where the varieties usually grown at the north will not make a crop the first season from seed. Since these Onions have come into use there has been a large falling off in the quantity of Onion "sets" used, and the practice of using sets will soon be abandoned, at least with those Onions which produce seed. Those who grow the Italian Onions only from spring-sown seed, however, have no conception of the size they will attain if sown in autumn. How far north fall sowing can be practiced I cannot say, but whenever it is practicable to carry the crop through the winter the autumn is the time for sowing. The Giant Rocca Onion, which is very unsatisfactory from spring-sown seed, attains a size, when sown in fall, which fully justifies its name, and the large Tripoli sorts are immense. Here (latitude thirty-five degrees forty-seven minutes) we sow the seed at any time in October. Northward an earlier sowing would be better, so as to get the roots quite strong before winter. Here bulbs and tops grow all winter, and as the bulbs gain their size before extremely hot weather comes on, they reach a development which we cannot get with other sorts.

For family use and particularly for pickles the little White Queen Onion is unsurpassed. With this variety we can in

this latitude raise two crops in one season. It is best sown in February or March, as it matures very quickly, and a second crop can be sown here last of August and make good bulbs before Christmas.

The Striped Cucumber Beetle.—In my gardening experience of over thirty years I have never found any need for protectors to keep the striped bugs off of Cucumbers, Squashes or Melons. These beetles usually attack the plants when in the seed-leaf state, and seldom do much harm afterward. As soon as the seed-leaves appear the bugs appear also, but a handful of bone flour dusted over each hill will keep them away. One application usually suffices, but if washed off at once a second dusting will be needed. This is not only less trouble than boxing over the hills, but the bone flour is a good fertilizer, and stimulates the growth of the plants, so that they are soon out of reach of the beetles. Devices to protect plants from the weather are useful, but bug protectors are unnecessary, in my judgment. *W. F. Massey.*
College of Agriculture, Raleigh, N. C.

Correspondence.

Park Construction.

To the Editor of GARDEN AND FOREST :

Sir.—Every landscape gardener who has had much experience in the creation of parks understands that his work is but half done when he has completed his design. However carefully he may have prepared his plans, detailed specifications and instructions, he knows that the result depends upon the skill of the man who has charge of the construction. It is rarely the case that the designer is allowed to exercise more than an occasional supervision of the work. Having furnished working plans drawn to scale, lists of trees and shrubs, with explanations of all matters that cannot be represented in drawings, his duties are supposed to be finished, and the work of construction begins under the direction of an engineer or a superintendent, who is employed by the park commissioners and is subject to their direction. The designer ought, of course, in all works of importance to supervise the construction, for there is always much that is essential in carrying out details, which can by no possibility be represented on a plan or described in words, but must be directed on the ground by the artist's eye. This, however, at least in the west, is often impossible, or rather impracticable.

Park commissioners in this section, as a rule, are unwilling to incur the expense of such supervision, and having secured the plan, they leave it to the superintendent and the engineers to transfer it to the ground. Not infrequently the work of grading, road making, etc., is let out to a contractor and the tree planting to the man who will do it at the lowest cost. The result in either case is sure to be unsatisfactory, and if it is further complicated by the officious interference of some prominent member of the Commission who has a local reputation as a connoisseur in art, it is probable that a large amount of money will be wasted on artificial decorations, which are utterly incongruous and destructive of the effects of the original design.

There is but one way in which the work can be satisfactorily performed, and the all-important person to ensure such performance is the park superintendent. I speak confidently on this point, from having in repeated instances witnessed the worse than useless expenditure of large sums in the effort to economize by dispensing with the services of a skilled superintendent, or by employing an incompetent man because he could be had at a low price.

It is all-important in the first place that the superintendent should be a manager of men and able to work them advantageously; for otherwise thousands of dollars may be wasted in loss of time or inefficient work. Where hundreds of teams are employed, a load or two more or less in a day's work of each one becomes a matter of hundreds of dollars before the week is out. And so of every item of the work performed. These are the costly leaks. A competent man will secure from every employee the full amount of his labor, and without any appearance of needless crowding. But this is only one of the essential qualifications of a superintendent. He must be sufficiently familiar with park construction to appreciate the general effects intended by the design, and in directing the work of grading and road making, as well as in planting or removing trees, opening up woods, etc., he must work with steady and intelligent purpose to develop these ideas. He must know enough of soils and of tree planting to see to it

that all newly graded ground is provided with sufficient depth of fertile surface soil, and that all such soil, as well as other fertilizing material, is preserved, and that the trees after being properly planted are properly cared for. He will of course employ tree planters and gardeners, but he must himself be sufficiently skilled in the practice to know when each operation is thoroughly performed.

It is plain from these considerations that a capable superintendent may save to a city in a single week more than the difference between his year's salary and that of an incompetent man; and yet it is almost invariably the case that a board of park commissioners is beset by candidates who are ready to work for a low salary, and such a man is often selected from fear that they will be charged with extravagance if they employ a man who knows his business and demands what his work is worth. In the course of forty years' experience as a landscape-gardener, I have had such repeated evidence of the "penny wise, pound foolish" policy of employing cheap men, and such opportunity of enjoying the results of a wiser course of action, that I take this method of presenting the matter for the consideration of every one who is interested in parks and their construction.
H. W. S. Cleveland.
Minneapolis.

A Northern Station for *Quercus lyrata*.

To the Editor of GARDEN AND FOREST :

Sir.—On the 13th of September last, while gunning in the bottoms of the Patuxent River, about three miles below (east of) Laurel, Maryland, I was surprised to find myself confronted by an old acquaintance in several trees of *Quercus lyrata*. The tree was rather common there, growing along the banks of shallow "sloughs" and in other wet situations, the trees associated with it being *Q. Michauxii*, *Q. bicolor*, *Ulmus Americana*, *Liquidambar styraciflua*, and several others which thrive best in wet locations, with *Fagus ferruginea* in the immediate vicinity. While the *Q. lyrata* was fairly common, it was of small size, none of the trees much, if any, exceeding thirty or forty feet in height.

Before finding this species, I had been struck with the exceedingly close resemblance between the tree growth of the locality and that of our western bottom-lands, there being but three species (*Quercus phellos*, common, and *Ilex opaca* and *Juniperus Virginiana*, rare) among the twenty-three species growing there which were not common to the two regions! Of course many western types, or those which are more common west (as *Tilia*, *Æsculus*, *Negundo*, *Gymnocladus*, *Gleditschia*, *Cercis*, *Catalpa*, *Celtis*, *Juglans*, *Populus*), were wanting, but the general facies of the silva and manner of growth were exceedingly similar, *Asimina*, *Liquidambar* and *Liriodendron* being very common.

It is interesting to note that this station of *Quercus lyrata* is almost exactly on the same parallel of latitude (near thirty-nine degrees) as the locality where I found it in the summer of 1888 in southern Illinois (bottoms of the Embarras River, Jasper County).

The note in a late number of GARDEN AND FOREST on the occurrence of *Tillandsia* in northern Tennessee reminds me that in the summer of 1880 or 1881 I found this plant on the eastern shore of Virginia, about midway between Cherry-stone and Cobb's Island landing. It was not plentiful, but I found several tresses of it hanging from the large Pine-trees (*Pinus Tæda*) and Hollies (*Ilex opaca*), by or near the road-side. This, I believe, is its most northern station on the Atlantic coast.
Robert Ridgway.

Washington, D. C.

American Oaks in Belgium.

To the Editor of GARDEN AND FOREST :

Sir.—American Oaks have been introduced into Belgium comparatively recently. The oldest in the country are hardly more than a hundred years old. They thrive here admirably, however, and grow with astonishing rapidity in a light, sandy soil with a rather moist subsoil, the annual shoots often exceeding four feet in length. The Belgian government has of late years devoted a great deal of attention to plantations of trees along the highways. Our Elm (*Ulmus campestris*) injures crops in the neighborhood of the highways with its long superficial roots, and on this account has been largely abandoned in highway plantations; and where the soil is adapted to them, the Red and Spanish Oaks have been largely planted. In the province of Limbourg, where the soil is suited to them, thousands of these two trees have been used with the greatest success. The growth of the Red Oak

is marvelous. Trees only forty-five years old have an average trunk circumference at three feet from the ground of five feet eleven inches, and an average height of more than sixty feet. The actual money value of these trees is from six to eight dollars. In another plantation made in 1845 the trunks have an average of four feet eleven inches, and in still another made as late as 1852 they have an average trunk circumference of five feet three inches. If the development of the Red Oak continues to be as satisfactory in the future as it has been, we shall be able to show in Belgium trees at least three and a half feet in diameter and nearly one hundred feet tall.

The density of the wood of *Quercus rubra*, as compared with our native Oak, *Quercus Robur*, is: *Q. rubra*, 391; *Q. Robur*, 377. The comparison of these two totals shows that the wood of the American species is harder than that of the European. In the trials which have been made to determine the value of the wood of the American tree grown here, in carriage-building and in cabinet-making, its great value has been amply demonstrated. Where the native Oak remains dwarfed and stunted owing to a soil too light for its best development, the Red Oak grows with luxuriance; and its introduction into those parts of Belgium where the soil is light and sandy is a benefit which all land-holders now recognize; and it appears evident that in a few years the American Oak will have replaced the native species in many parts of the country.

Quercus palustris seems destined, like the Red Oak, to be a very useful tree here. There are plantations in this country already sixty years old, containing trees with trunks more than six feet in circumference. It appears, therefore, that this species grows more rapidly even than the Red Oak; and it is noticed that the trunk rises more rapidly than the trunks of other American Oaks. There are some beautiful plantations of this tree along the highways of Limbourg, admirable examples of luxuriant vegetation and promising the best results for the future. It is now proposed by the government to make trials with *Quercus tinctoria* and *Quercus Phellos*. Possibly these facts, the result of experiments in a foreign country, may have some interest for the American readers of your journal.

Mons, Belgium.

Alfred Wesmael.

The Waverly Oaks.

To the Editor of GARDEN AND FOREST:

Sir.—I have read, with much interest, the editorial in GARDEN AND FOREST for February 19th, upon the Waverly Oaks. I have met with no such interesting group of Oaks as these. Their location so near the picturesque cascade of Beaver Brook, and upon a supposed local terminal moraine, their grand proportions, their undoubted great age—all about them is worthy of marked attention. It seems to me that their destruction would be an act of vandalism. The suggestion which you emphasize, that the trees should be preserved by setting apart the ground containing them as a public park, is certainly a wise one; and if the park could include the "Cascade" with the glade below it, together, it would be one of the choicest bits of public ground in the vicinity of Boston.

It may not be inappropriate to quote the dimensions of a few White Oaks in Rhode Island, from data which I made and published ten years ago. One of these is on the Owen farm, in Pawtucket, in an open lot on the Power Road from Providence to Pawtucket. The tree has had opportunity for development in the open ground for a century or more, and it is noticeable for its great spread of ninety feet across. The six lower limbs are thrust out nearly parallel to the slope of the ground, and one of them is fifty feet long. The supporting power of these massive members must be enormous. The body is small in proportion to the size of the tree, being only nine feet in circumference at four feet from the ground.

Another remarkable tree stands just over the state line in Massachusetts at Munro's Tavern. In 1858 its circumference, three feet from the bottom, was sixteen feet three inches. There is a tradition, which seems authentic, that a company of soldiers, returning from service, camped about the trunk of this tree and spent the night under its protection. The Catholic Oak, at Lonsdale, girthed, in 1878, fourteen feet at four feet from the ground.

Providence, R. I.

L. W. Russell.

Prairie Forestry.

To the Editor of GARDEN AND FOREST:

Sir.—In a recent number of GARDEN AND FOREST appeared an article in which the writer held, very properly, that tree-planting is not forestry. And yet, in the vast prairie regions

of the country, where the need of forests is more apparent, though not so great in reality, as among the mountains, the sources whence all our great rivers flow, forestry must mean tree-planting for many years to come. To the people of the western prairies—the Dakotas, Nebraska, Kansas, Iowa and western Minnesota—the word forestry has become synonymous with tree-planting, and conveys no other meaning. It is indeed fortunate that this is so. The prairies can never know the primitive meaning of the word forestry until they cease to be wind-swept. Every year the treeless belt becomes narrower, through constant planting on its eastern border; and while it is true that the prairies will never be forested by the individual enterprise of the farmer, it is equally true that the whole aspect of the west has been changed within the past twenty years. Planted trees have clothed the naked landscape, and homes have been sheltered and the growth of fruit made possible. In crossing the state of Iowa from Dubuque to Sioux City the traveler sees a wonderful example of what forestry means on the prairies. In the eastern part of the state native woods abound along the streams, but after leaving the valley of the Cedar, plantations become a feature of the landscape. Every house seems embowered in trees, suggesting shelter and comfort for the inmates. Farther west these groves decrease in size and number until, beyond the Des Moines River, the prairies are almost as bare as they are in central Dakota. Every year the groves increase in number and in size, and if prairie foresters in Iowa continue to plant trees in the next decade as in the past, the state will have almost genuine forest conditions. It will at least have solved for its open prairies the difficult problem of protection from wind, and they may do much toward eliminating the disastrous droughts that have been such a burden to agriculture during recent years.

Brookings, S. D.

Chas. A. Keffer.

Populus certinensis.

To the Editor of GARDEN AND FOREST:

Sir.—Under this name we received from the Arnold Arboretum, a number of years ago, cuttings of a Poplar which promises to be very valuable on the high, dry prairies of the north-west and west, as it maintains perfect health of foliage and makes a clean, rapid, upright growth where the Cottonwood and other native trees of the bottom-lands of our streams utterly fail to live. I speak of it at this time, hoping to discover the origin of this name. I do not find it in Koch's "Dendrologie" or in any other work in our libraries, and it appears to be identical with, or very closely related to, *Populus Petrovsky*, as sent us by Director Arnold, of Moscow. It also appears to be very closely related to the species known in Russia as *Populus Wobsky*. As this tree has come to stay in the west, I am anxious to determine its origin and its correct name.

Ames, Iowa.

J. L. Budd.

Periodical Literature.

THE February issue of the Kew *Bulletin of Miscellaneous Information* contains an article on the *Manufacture of Quinine in India*, in which the new oil process for manufacturing sulphate of quinine is explained. The success of this process is a matter of some importance, for if Cinchona-alkaloids can be cheaply extracted from the bark at the place where it is grown, a great saving will be made in the cost of transportation to Europe and America. Mr. C. H. Wood, late government quinologist to the government of Bengal, in an appendix to this paper, sums up the chief advantages of preparing quinine in this manner as follows: "First, the alkaloids are completely extracted from the bark in a much greater state of purity, so that the final operations for obtaining pure and finished products are much simplified. Second, that the whole process of extraction can be performed at common temperatures. Third, that the apparatus and appliances required are all of a simple character and are well suited for use on the plantations."

The low price of Cinchona-bark, quinine and other Cinchona-alkaloids is explained by the immense exportation of bark from Ceylon. It is only a few years, comparatively, since the Cinchona-tree was first introduced into Asia through the efforts of the British government, but the quinine raised in the government plantations of Ceylon, India and Java already far exceeds the amount produced in the native forests of the Andes; and therefore regulates the price of the product.

The introduction and cultivation of the Cinchona in Asia is one of the most triumphant agricultural successes the world has ever seen, so far as the consumers of quinine are

concerned. Overproduction, however, has had the natural results with the planters, and quinine is now sold in London at prices considerably below the cost of production. This is due principally to the state of affairs in Ceylon, where the Cinchona was planted in immense quantities to replace the Coffee-tree, long the staple product of the island, when the coffee crop began to fail from the fungoid disease which attacked the trees. Then the Cinchona failed there to a certain extent, and the planters turned their attention to tea-planting, cutting down the Cinchona-trees by wholesale and throwing the bark on the market in immense quantities, and with fatal results so far as the price of the commodity was concerned. This state of things, however, sooner or later will correct itself, and the world owes a debt of gratitude to the authorities of Kew, through whose instrumentality the Cinchona-tree was first successfully transported from the new world to the old, for this successful piece of work, a good example of the practical value of a great scientific establishment of this character.

There are papers, too, on the use of the berries of the Maqui (*Aristotelia Maqui*) in coloring wine. The Maqui is a small evergreen tree or shrub, which is common in the mountain regions of Chili, belonging to the same family as the Lindens, and with the same fibrous inner bark. Maqui berries are eaten in Chili either fresh or preserved, and mixed with grapes are made into wine. Of recent years they have been collected and exported to Europe in very large quantities for the purpose of coloring wine. This industry seems to be growing rapidly. In 1884, 26,592 kilos of the dried berries were sent to France, while in 1887 the quantity had increased to 315,774 kilos. The berries are used in the same way and for the same purpose as Elder-berries have been used in France. The present issue of the *Bulletin* contains also shorter articles on *Vine Culture in Tunis*, on the *Phylloxera in Victoria*, on Baron Eggers' *Botanical Exploration of Cuba*, and a statistical article on the sugar production of the world, which, among other things, shows that for a period covered by the years 1853-1887, out of a total increase of production amounting to three and three and a quarter millions of tons, no less than two and a quarter millions of tons, or about sixty per cent., is an increase of beet-sugar, which has now changed its position as a factor in the production, having reached the point of being nearly equal to cane-sugar, whereas at the beginning of the period it supplied only one-eighth of the total production. The production of both British cane-sugar and foreign cane-sugar has more than doubled in the same period.

Bibliography.

A List of Works on the Art of Landscape-Gardening.

THE following list of works treating of landscape-gardening which have been published in English, French, German and Italian since 1625, the date of Bacon's classical essay, has been prepared in the library of the British Museum, in the Bibliothèque Nationale and in other public and private libraries, and is as complete as I have been able to make it. I have endeavored to include all books, pamphlets, articles and reviews except those which have appeared in horticultural and agricultural papers. Such a work is necessarily liable to error, and I shall be glad of any suggestions or corrections which will help to make the list more complete and correct.

Those books which seem to have a special interest are marked with a star.

Brookline, Mass., Feb. 1st, 1890.

Henry Sargent Codman.

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1638. JACQUES BOYCEAU DE LA BARAUDIÈRE.—"Traité du Jardinage selon les raisons de la Nature et de l'Art." Paris, folio, ill. Ed. 2, Paris, 1678, 12mo. Ed. 3, Paris, 1689, 12mo. Ed. 4, Paris, 1707, 12mo.
1665. RENÉ RAPIN.—"Rapini Hortorum libri iv., et disputatio de cultura hortensi." Paris, 4to. French trans., "Les Jardins, poème latine en quatre chants," by Voyron and Gabiot, Amsterdam, 1782, 8vo. English trans. by John Evelyn, London, 1673, 8vo. Another by James Gardiner, London, 1716, 8vo.
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Notes.

Eucharis Bakeriana is a new species which has recently flowered in England in the St. Albans nursery, and which has been named by Mr. Sander in compliment to Mr. Baker, of Kew. It has the foliage of *E. Amazonica* and flowers as large as those of *E. candida*; it differs from all other species in having a conspicuous trumpet-like corona, as in the Daffodils. As a decorative plant it is the equal of *E. candida*.

The first cost of stocking a Narcissus-farm in the Scilly Islands is almost prohibitory except to a capitalist. The roots can be had for ten dollars a thousand, but a single acre will easily swallow up a million roots. Ten thousand dollars for stocking one acre seems like an expensive plant, but the increase is such that three acres can be planted the third year, and so long as the demand for the flowers lasts this will prove a lucrative investment.

The market gardeners of the south, particularly those about Mobile, have suffered seriously this year from injuries inflicted by the cut-worm. Truck farmers were obliged to employ a force of men to begin work at early dawn to search for the destroyers and to set out new plants where the young Cabbages had been cut off. The farmers attribute the great increase in the number of various pests to the extermination of insectivorous birds by pot-hunters, and by boys and others who shoot them out of mere wantonness.

Successful experiments have been made in Austria for the conversion of corn-husks into paper and cloth. The husks are boiled in an alkali until the fibres are reduced to a spongy condition. The glutine is then pressed from the fibre, which remains as a mass of chain-like, long threads, interspersed with shorter ones. The long fibres are woven into a good quality of coarse cloth, similar to that made from the lower grades of flax and hemp; and the short ones make an excellent paper, very strong, and hard and firm in grain.

The Cornelian Cherry (*Cornus mascula*) of Europe is now lighting up the shrub-borders of Central Park with its golden bloom. It is surprising that so good a shrub or small tree is planted so little in this country. It should have a place wherever spring flowers are admired, for it never fails to bloom profusely. Later on, when in full foliage, and in late August, when its cornelian-colored, cherry-like fruits are fully ripe, it is a most attractive object. Up to the present time, moreover, it has escaped the ravages of the destructive larvæ of the Cornel Saw-fly, which was described and figured in vol. ii., page 520 of this journal.

Beyond Boma, according to Mr. Tisdell's interesting account of the Congo Basin in the *Century Magazine*, there is nothing at all in the valley of the Congo wherein he traveled which one could describe as a forest in any particular. While one does find some large trees, they are few, and principally Mangroves. Nothing indicates that there ever has been a growth of timber. In the first place the soil is not of sufficient depth or richness to produce timber or even to produce anything. About the only thing that grows along the valley is wild grass, sometimes ten, twelve, fifteen and even twenty feet high; and throughout the whole country are zigzag paths made by the natives and utilized by the caravans.

Harpers' Weekly for February 22d gives an illustration of the new gateway for Harvard University, recently built by Messrs. McKim, Mead & White, together with a reproduction of the design as at first proposed. It was noted in these columns about a year ago that this design showed a large central gate of wrought iron, flanked by stretches of wall in which were low, round-headed doors, and beyond these tall iron railings. As now constructed, the walls are solid and plain, and an iron gate, smaller than the central one, is placed beyond them on either side. The change is not an improvement; yet, as it stands, the entrance is both dignified and appropriate, and the treatment of the iron-work is described as particularly artistic and beautiful.

A lady writing from Michigan to the *American Florist* with regard to the rapidity with which bulbs may multiply if undisturbed for a few years, says: "I thought I would take one *Gladiolus* bulb and ascertain what the increase would be in five years. I selected Madame Monneret, . . . and in the spring of 1886 I planted one small bulb; in the fall of the same year I had one large bulb and over forty bulblets to plant out in the spring of 1887. In the fall of 1887 I had forty small but blooming bulbs, and, by actual count, 500 bulblets. In the fall of 1888 I had 500 small but blooming bulbs, and, by actual count, 4,500 bulblets. In the fall of 1889 I have 500 three-year bulbs, 4,500 two-year bulbs, and the bulblets I have

not had the patience to count, but thought 50,000 would be a low estimate. Next year would be five years, and I easily could have 50,000 bulbs if it were not for selling them as soon as they become marketable."

The municipal government of Paris has just purchased the Forestry Pavilion, of which an illustration was given in our issue of January 25th, paying the French Forest Department \$17,000 for it, and workmen are already at work preparing to remove the building from the Trocadéro to the Bois de Vincennes, at the other end of Paris. It is pointed out in the *Revue des Eaux et Forêts* that the city has made a foolish bargain. The pavilion was erected without permanent foundations, which will now have to be provided for it, and these and the cost of removal are estimated at \$2,000, making the cost of the building when set up \$19,000, which does not include any of the contents, which will have to be provided for in addition, as the Trocadéro exhibit is retained by the Forest Department. The great trouble, however, is not in the cost of the building, but in its temporary character, for it is shown that a building constructed of unseasoned logs, and dependent for its beauty upon the preservation of their bark in the natural state, can last at most only two or three years in a presentable condition.

The milder climate of England means a much earlier spring than ours and the later survival of a multitude of autumnal flowers, so that, in the southern counties at least, there is often not a week in the year when something pretty may not be gathered from the garden. But, on the other hand, our brighter winter skies are far more favorable to plants grown under glass. These facts were commented upon by Mr. Samuel Henshaw in an address recently delivered before the Florists' Club of this city, and the difficulty of forcing Roses in England was especially noted. "All through the middle of the winter," he said, "there is a great scarcity of this flower in England. Even Tea Roses are scarce and poor in quality." *Gloire de Dijon* Roses and a few varieties of Teas "were exhibited at the spring show in Bristol in March, but were few and very much inferior to what may be seen in any florist's window in the middle of the winter in New York." But in the southern parts of England the *Gloire de Dijon* "is often seen covering the fronts of cottages and in full bloom in the early part of May."

The production of Sisal hemp in the Bahama Islands is being rapidly developed, arrangements having been perfected lately to plant 10,000 acres with the Sisal under the stimulating influence of an export duty of £4 13s. 4d. per ton, paid by the government, on all Sisal hemp grown on the islands. Sisal hemp is produced from a species of Agave (*A. rigida*, var. *Sisalina*), a native of Yucatan, where it has been cultivated by the natives ever since the country was known to Europeans, and where of late years its cultivation has immensely increased on account of the growing demands in all parts of the world for larger supplies of Hemp than the East Indies have been able to supply. This great increase in the consumption of hemp-fibre may some day or other have an important influence on the agricultural prosperity of Florida. The climate, soil and vegetation of the southern shores and islands of Florida are identical with those of the Bahama Islands, and if Sisal hemp can be produced in those islands, it can be grown of as good quality, if not as cheaply, in south Florida, when it is known that the Sisal plant flourishes, and where it is now naturalized and spread over a considerable surface, it having been one of the useful plants introduced into Florida about fifty years ago by Dr. Perrine, who was employed by the government of the United States to study the economic value of various plants and test their adaptability for naturalization in Florida. He made a careful study of the Sisal in Yucatan, and the results of his investigations were published in Senate Doc. 300, Washington, March 12th, 1838. The principal crops of the Florida keys, of which only a very small part are cultivated at all, are tomatoes, grown to supply the northern markets in winter, and pineapples, which suffer during winters of unusual severity, and are not, so far as quality goes, a satisfactory crop. Extensive plantations of the Coconut have been made on the Atlantic coast; but although there are a few large Coconut-trees on Key West and near Bay Biscayne which yield fruit, it is doubtful if the climate of south Florida is sufficiently hot to produce coconuts which will be able to compete in the market with those grown under the more favorable conditions which prevail in Jamaica, British Honduras and Guatemala. Sisal is, on the whole, the most promising plant with which to experiment in southern Florida; and nothing but the cost of labor and machinery in Florida can interfere with the production of Sisal hemp in competition with that grown in Yucatan or in the Bahama Islands.

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Street-Trees.

A YOUNG tree on the border of a city street can never be said to have congenial surroundings, even when the utmost pains have been taken at the outset to plant it properly and to give intelligent attention to its needs so far as possible thereafter. Many kinds of trees will absolutely refuse to live in an atmosphere filled with smoke and dust, even when the drainage system of the city does not rob their roots of the water which is essential to their nourishment. The hardships which a street-tree must undergo make it all the more necessary that only the most promising individuals of the kinds best suited to endure the trying conditions of city life should be selected. This means that nursery-grown trees, with abundant roots and pruned for the purpose, should invariably be used.

It is plain that trees of one variety only should be planted in a long, straight row parallel with the lines of buildings in a continuous street. Much of the desired effect will be lost if the trees vary in form or size, or expression, or rapidity of growth, or in the time of putting forth their leaves or shedding them. An avenue of American Elms, with their lofty overarching tops, is always beautiful, because the charm of each tree is renewed in the next, and the effect of the whole is constantly intensified and multiplied by repetition. An avenue of stately Tulip-trees is equally beautiful, but in an entirely different way. The same might be said of a double row of Pin Oaks, where there is space for their drooping lower branches. But if all these trees were intermingled, and Sugar Maples, Horse Chestnuts and others still were added, the result would be incongruous and contradictory. There would be no continuous lines extending through the entire vista to help the perspective and to give unity of character and expression and consistency of purpose to the whole. And yet in our city street-planting it is the common practice to allow each lot owner to select the tree which suits his fancy. The immediate effect is bad enough, but it grows worse as years roll on and the individual trees become more and more unlike each other as their peculiar characteristics are more strongly marked with age.

But even when the best selection is made, disappointment and failure will be the inevitable result unless the ground is properly prepared and the planting carefully done. A street grade is often made several feet below the natural surface of the ground, and of course this subsoil is not in a suitable mechanical condition to receive the roots of trees, nor does it contain the necessary nourishment. Or, again, a street may be raised as much above the natural level, filled in at the bottom, perhaps, with large rocks which have been thrown together so as to leave air spaces between them, and this open foundation may be covered with a stratum of all sorts of rubbish. No tree can be planted in such a situation with any promise of health or long life. In most cases, an excavation twenty feet across and three feet deep, filled in with good loam, will make a safe place in which to plant a tree, but even here the tree will be doomed to early death if it is just over such a foundation of broken rock as has been mentioned above. We might add that street-trees should always be planted far enough apart to give each one an opportunity to develop into its best proportions, but perhaps many persons who read this already feel inclined to resent the frequent iteration of these elementary principles. And yet there is hardly a city in the United States where every one of the ordinary, common-sense rules and precautions which should be regarded in planting street-trees is not almost constantly violated. The fact is, that this article was itself suggested by some planting in this city which recently fell under our observation.

West End Avenue, a broad street on the heights between Riverside and Central Parks, is laid out with a strip of turf some eight feet wide on either side between the sidewalk and wheelway. In each strip is a double row of trees, not planted in pairs, but alternately—that is, with one tree near the outer margin of the grass, and then another near the inner margin. The shortest or diagonal distance between these trees is about fourteen feet. They are Red Maple saplings, apparently pulled up from a swamp where they stood very closely, so that they had grown up straight and slender to a height of probably fifteen feet, with very few, if any, side branches. The tops were all cut off at a height of about ten feet, leaving bare poles above ground and a few of the larger roots below. These trees were planted in the autumn of 1887 and the following spring, and have, therefore, had two summers to grow in, but as a matter of fact there has been no growth. Clusters of little branches have been thrown out at the tops and at a few points on the sides of the mutilated stems, and these tufts of foliage may prolong the life of the trees for a time; but they are rather signs of approaching death than of life. Many of the trees are already leaning over and ready to fall. In short, here is a street nearly two miles long, planted with at least three times as many trees as should have been used—trees of a variety unsuited to the position they occupy, and not a single individual of them all a specimen well grown and pruned for this purpose. The city has paid some \$20,000 for this work, which is absolutely worthless—worse than worthless, indeed; for while these trees are dying, years are wasted in which good trees could have been making substantial growth, and even now they would have been delighting all beholders with their beauty, and still more with the cheerful promise of increasing attractiveness for years to come.

If this were an isolated instance it would be sufficiently depressing, but equally bad examples of contract-planting by municipal authorities can be pointed out in almost every one of our large cities. The streets of our towns and cities will never be shaded by handsome and well-cared-for trees until they are placed in charge of some competent and responsible officers, whose duty it is to superintend all planting, and all pruning, too; for now no street-tree, however beautiful, is safe from the attacks of axes and saws in ignorant hands, which not only destroy its symmetry, but leave it with raw wounds to invite the entrance of destructive fungi, which bring disease and premature death.

PROFESSOR KELLERMAN, in *The Industrialist*, quotes approvingly what was said in our issue of January 22d of the ornamental value of the Celtis or Hackberry, as it is usually called in the west, and he adds that in Kansas it has a greater relative value than in well-timbered regions, where so many kinds of trees grow in perfection. In the state, which includes a large portion of what was once known as the "Great American Desert," the Hackberry is one of the few trees which can withstand the drought, hot winds and other trying characteristics of that variable climate. Professor Kellerman, however, calls attention to the fact that the annual report of the Kansas College Experiment Station for 1888 gave a full account of an insect—a species of *Phytopus*—and of its invariably accompanying fungus (*Spherotheca phytotophila*, Kell. & Sw.), which are doing great injury to the Celtis in that region. The insect is a gall-mite and the fungus a species of powdery mildew, and they cause what is known as "Hackberry knot," an abnormal growth which seriously injures the health and appearance of the tree. The disease is said to occur in the eastern part of Kansas, and it extends westward as far as the forest-trees extend. It is also reported in Iowa. Professor Kellerman has not found the trees in the forest abundantly attacked, but most of the isolated ones are disfigured by the multiplying knots until they become very unsightly and finally die. No remedy has been experimentally determined upon except cutting off and burning the infected parts.

A figure of one of these knots is given in *The Industrialist*, and we refer to it because we have recently observed a similar appearance on many specimens of the Celtis in Central Park, in this city. A more careful investigation will be needed to identify this disease with the western one, but it is not improbable that trees of this species throughout the country have found a serious enemy.

Japanese Dwarf Plants at Paris.

IT is well known that the Japanese landscape-gardener prides himself on his treatment of areas so small that we should give them up to a gravel walk and a couple of Geranium beds. So it was a disappointment not to find, on the soil of the Japanese Horticultural Section in the Exhibition grounds at Paris, some illustration of his practice.

The Japanese Horticultural Section was only a small space on a rather steep part of the Trocadéro slope, surrounded by a rough bamboo fence which would doubtless have looked pretty amid consonant surroundings, but seemed a little slovenly and poor by contrast with neighboring French arrangements, which were scrupulously trim and durable looking. Almost the whole of the enclosed space was laid out in a series of low terraces, each of which bore a row of potted plants.

I was not wise enough to know whether any of these plants had especial interest for the European botanist. But I soon saw that some of them were extremely interesting to the cultivator and the student of art. These were the examples of dwarfed trees. We have become familiar, in our own gardens, with certain dwarf varieties of trees produced in Japan, as with many kinds of little Maples; but I speak especially of dwarfed specimens of individuals which, if left to themselves, would have been large, but which generations of gardeners had patiently restricted to the most exiguous proportions. These we constantly see in Japanese pictures, but there is seldom a chance to behold them alive.

In the *Bulletin de la Société Botanique de la France* some facts were recently given with regard to the method of their production, on the authority of two Japanese connoisseurs, one of whom was an exhibitor in Paris. The chief point is that the trees are grown in the smallest possible quantity of soil. The baby plants are put in pots so small that their roots soon fill them entirely, and, seeking further nourishment, break out above the surface. Then a somewhat larger pot is given, in which, however, the same want of sufficient nourishment soon produces the same result; and this treatment is perpetually continued. Moreover, only just so much water is supplied as is absolutely needful to preserve life. The main root thus becomes bent and the lateral roots develop neither quickly enough nor profusely enough for vigorous growth, and all the processes of life are very greatly retarded. The

roots are never cut off, and through their gradual elevation the whole plant is sometimes raised on what looks like a system of aerial roots.

Again, the twigs are early bent, so that they cross one another, or the stem, in abrupt or zigzag ways, Bamboo-fibres being used to bind them temporarily in place. Thus all growth which does take place is kept within dwarf dimensions, so that the stem, after fifty or one hundred years of life, is often but from an inch and a half to three inches in diameter and about ten times as high. If a bent twig dies it is cut off, and the new one which springs from below it is forced to take its place. This sometimes produces the look of a graft. Frequently a piece of Fern-stem or a bit of tufa or coral is so placed that the main stem bends around it. If all the twisted branches die, new ones are then grafted on the old stock. Conifers bear this sort of treatment much better than dicotyledonous plants, as the tendency of these to throw out side shoots can tire the patience even of Japanese gardeners. For no detail of free growth out of harmony with the forms of the main branches can be allowed. Every smallest twig must scrupulously accommodate itself to the general effect. *Thuyopsis dolabrata*, *Chamaecyparis obtusa*, *Pinus parviflora* and *P. densifolia* are among the conifers most commonly chosen for dwarfing. Some of those exhibited in Paris were nearly 150 years old, and were valued at hundreds of dollars. They tempted the purse of many observers, but I doubt whether any one was rash enough to buy, for it was plain that their value depended on a continuance of the Japanese cultivator's skill—they might as well die at once as live to lose their character through unregulated growth.

What now was the artistic interest of these specimens? Sometimes it was merely the charm that lies in anything quaint, bizarre, grotesque. But often we saw forms so beautiful in their way and so clearly illustrative of one phase of Japanese artistic endeavor that it was a pure delight to study them. Often these little trees were not bizarre and patently deformed, but as fine in their outlines, as grand in their masses, as imposing in their effect, as suggestive of ideas of long existence and vigorous development, as could be the most mighty specimen seen out-of-doors. It needed a little effort to put one's self at the right point of view. But it soon was easy to look at them as the Japanese himself must look—to consider them as miniature representations which the eye knew to be small, but the imagination accepted as large—that is, it was soon easy to look at them as we look at little pictures or at statuettes. If a reproduction of a large form on canvas can satisfy eye and mind, although it measures but a few inches itself, why cannot one be likewise accepted when wrought in the same material as the original? Here was a portrait, so to say, of a great Thuyopsis or Pine, which, in a pot scarce twelve inches across, we could have perpetually at hand not merely to suggest, but actually to show, the beauty of its original. Here in portable shape we had form, color, substance, movement, odor—everything but size; and when we had learned how to look we missed size even less than in one of Barye's tigers or in a miniature of a familiar face. The best of these little trees were not mere curiosities, but true works of art. If simply kept small they would have been the former; but kept small and looking gigantic, they were artistic in intention and result. Of course such an effect could be produced only by the twisting processes employed. Mere retardation of development would not answer. If we could keep a six-year-old White Pine forever of the same size and shape it would never look like a century-old one. It must be forced to take a shape characteristic of maturity. Nor does it matter, I think, whether or not the shape achieved is precisely that of a freely-developed individual of the same species. So long as the dwarfed tree looks as though a freely-grown large one might have assumed this shape, the artistic ideal is achieved.

But still more interesting than these isolated dwarfs were certain arrangements where a number had been grown together. Several creations of this sort had been brought to Paris, but so far as I saw, only one remained in perfect condition. This was exhibited in August at one of the flower shows in the great tent, and may have been noticed there even by visitors who did not penetrate the Japanese section. It consisted of a board about as big as a tea-tray with a raised rim around the back and sides. At the right hand back corner was a thick irregular group of conifers, some eighteen inches in height, massed around a large stone. So carefully had the shape of this stone been chosen and the shape and arrangement of the plants been studied that the effect was precisely the same as though we saw a great precipitous rock surrounded by graceful yet imposing trees of natural size. A lower mass of foliage formed the centre of the background,

and to the left was another higher mass of conifers interspersed with deciduous trees, seen beyond a lofty bridge. The foreground was composed of moss and low grasses broken by taller tufts and by patches of a tiny flowering plant—as I remember, an *Oxalis*—and foreground and background were united by plants of intermediate sizes in the most thoroughly artistic way. The horticultural skill displayed was marvelous; for not only the trees but the grasses and everything else must have been dwarfed to bring them to such fairy-like proportions, an inch counting for a considerable elevation, and the flowers being no bigger than pin-heads, yet each and every plant being in perfect condition, and the general effect luxuriant and rich. It was not a little toy-shop garden—it was a little living picture of a broad landscape of incomparable beauty and grandeur. If one took a moment to get absorbed in the scene before him, he thought no more of dimensions than if he had been looking at painted canvas. What he saw was a shadowy glen where rich green grass was starred with yellow flowers, where coolness and freshness breathed from the air, and in the background great masses of rock and foliage that stirred the imagination as well as refreshed the eye. The marvelous skill of the horticulturist was forgotten in wonder at the power of the artist who could conceive so beautiful a landscape. The way in which foreground, middle distance and background had been contrasted yet harmonized, the grandeur yet softness of the massing, the loveliness of the sky-line, the variety and beauty of the color, all kept in a low, quiet tone with no crude notes—these merits impressed one as in the work of some great painter; and what a painter would have supplied in the way of atmosphere and perspective was added by the modeling and shadowing of Nature herself. Of course the result had not the suggested poetry that we find in a Corot; nor could such a living picture on a board ever give effects of distance or supply the canopy of heaven. But within the limits possible to such work, there seemed nothing that the Japanese artist had not accomplished. As a “realistic” picture of a rocky glen no painter could begin to equal it, for it was as perfect to the tiniest detail as it was in the effect of its largest masses. In short, if on the soil the Japanese landscape-gardener had shown us nothing, here he showed us something in which we could read an account of his larger enterprises.

There was nothing I saw in all the Paris Exhibition that I coveted as I did this exquisite, and, to my eyes, novel work of art. But if it would have been rash to think a single dwarfed tree might survive in European hands, how should one dare to touch this far more complex bit of art-created life? It seemed a pure marvel that it had been brought half way round the world even by those competent to care for it at home.

New Brunswick, N. J.

George Cumming.

Some Old American Country-Seats.—V.

MONTGOMERY PLACE.

JANET LIVINGSTON, a sister of the Chancellor, grew up in the quiet elegance of Clermont, but after her gallant young husband, General Richard Montgomery, was killed at Quebec, she chose and purchased for her home a tract of three hundred acres lying upon the river by the mouth of the Saw Kill and a few miles south of the southern limits of Clermont Manor. Here, with the help of plans which are said to have been sent from Ireland by Montgomery's sister, a Lady Ranelagh, a mansion remarkable for its simple but elegant architecture was built, and the new seat was named Montgomery Place. Here in later years the eminent jurist, Edward Livingston, was wont to retire from the cares of office to enjoy the beauties of nature.

Approaching the estate to-day from Rhinebeck or from Red Hook, the way lies through a charming farming country crossed by numerous lane-like roads and by the one highway which leads to Albany. The approach to the house at Montgomery Place parts from the high-road at right angles, and leads, at first straight, toward the river through an avenue of noble trees of various sorts, planted in rows, yet not in pairs. Indeed, not only is there no precise symmetry, but a giant Locust may here be seen standing opposite a Linden (as in the picture on page 143), or a great Horse-chestnut opposite a Beech; and in one place, where the road is carried on a stone-walled causeway over a little gully, great Willows throw large limbs across the vista. Beyond the rows of trees, on either hand, lie gently undulating pasture-lands, bounded in the distance by woods. Drawing nearer now to the house, the straight avenue ends just as the roadway passes through a tall hedge into the inner park. Here is a wood of fine forest-trees standing well apart, and, as the road curves gently to the right between the trees, a little valley on the left begins to fall away

quite rapidly toward the Hudson. The sides of this valley are richly wooded, and serve to frame a first glimpse of the river, where it is disclosed by the broadening of the valley's mouth. As the road swings still farther to the right, the house comes into view ahead, and branch roads lead on the left to the stable, and to the kitchen yard, which is concealed by shrubbery and by being sunk to the basement level at the southern end of the house. The main road ends with an ample turn, placed symmetrically before the semi-circular portico which marks the entrance. The guest of the house who turns here looks eastward back toward the Albany road across a gently rising lawn bounded, on one hand, by the same dense wood which he before saw limiting the northern pasture, and, on the other, by the more open groves through which he has just traveled. Formerly this sheltered open ground contained the flower-garden and an elaborate conservatory; and, on the gentle rise behind this structure, a considerable arboretum once existed, where now only a few scattered specimens are to be seen; but from the point of view of design and general effect the substitution of the existing simple but well framed lawn in place of the old garden and conservatory is by no means to be regretted. The entrance front of the house as it now appears, when viewed from the site of the conservatory, may be seen in the picture on page 142; but though the building and the great Locusts near the porch are well shown, the picture gives no hint of the blue distance of hills and mountains which in reality appears through the tree-trunks just north of the house.

If, tempted by this glimpse of distance, the visitor turns the corner of the building and steps into the round-arched pavilion which is attached to the north side of the house, the whole broad panorama of the river and the Catskills is spread before him to the westward; but even here the wide prospect is broken into scenes and framed by the solid piers and arches of the pavilion itself, and by the trunks and branches of great trees, chiefly Locusts, standing on the brink of the irregular grassy slope which falls steeply to a narrow wood on the bluff at the river's edge. “To attempt to describe the scenery which bewitches the eye as it wanders over the wide expanse to the west from this pavilion would be an idle effort,” wrote Mr. Downing in 1847. “As a foreground, imagine a large lawn waving in undulations of soft verdure, varied with fine groups, and margined with rich belts of foliage. Its base is washed by the river, which is here a broad sheet of water, lying like a long lake beneath the eye. . . . On the opposite shores, more than a mile distant, is seen a rich mingling of woods and corn-fields. But the crowning glory of the landscape is the background of mountains. The Kaatskills, as seen from this part of the Hudson, are, it seems to us, more beautiful than any mountain scenery in the Middle States. It is not merely that their outline is bold, and that the summit of Roundtop, rising three thousand feet above the surrounding country, gives an air of more grandeur than is usually seen even in the Highlands; but it is the color which renders the Kaatskills so captivating a feature in the landscape here. . . . Morning and noon the shade only varies from softer to deeper blue. But the hour of sunset is the magical time for the fantasies of the color-genii of these mountains. Seen at this period, from the terrace of the pavilion of Montgomery Place, the eye is filled with wonder at the various dyes that bathe the receding hills—the most distant of which are twenty or thirty miles away. . . . It is a spectacle of rare beauty, and he who loves tones of color, soft and dreamy as one of the mystical airs of a German maestro, should see the sunset fade into twilight from the seats on this part of the Hudson.”

Mr. Downing did well to sing the praises of the Catskill sunsets, and he might have added that this favored pavilion of Montgomery Place spreads its prospects before the visitor to the delightful accompaniment of the music of waterfalls sounding from the depths of the wood near by. Upon entering this wood it is seen to occupy a large and long valley curiously broken into lesser ravines and hollows. Numerous paths lead through the dark shadows of the wood to all the finest parts and to the falls—one of them forty feet high—by which the Saw Kill plunges down to join the Hudson. Here are wildness and extreme picturesqueness in sharp contrast with the stately breadth and quietness of the lawns and groves about the house and the majestic panorama of the river. Well may Mr. Downing have called Montgomery Place second to no seat in America for its combinations of attractions; and it may be added that its makers and owners—all of them Livingstons, or close connections of the family—have been second to none in the taste and skill which took advantage of glorious opportunities and in the care which has preserved the essential features of the original design until this day.

Boston.

Charles Eliot.

Vegetation in Southern Alabama.

THE first frost of the last winter appeared here on the 26th of November, and two lighter ones followed on the first two days of December. These chilly mornings scorched the foliage of tender tropical plants which were yet unhooused, but the vitality of the stems remained unimpaired. The Cestrums, Brugmansias, Hibiscus, Lantanas and Abutilons soon recovered and continued to bloom. Bananas, Caladiums, Hedychiums and Cannas quickly threw out new leaves, and now, on the first of March, are clothed with fresh young foliage. Aloes, Dracænas, tender Yuccas, Palms, *Cycas revoluta* and the various Cactuses are thriving luxuriantly in the open air, while Geraniums, Begonias, Amaryllis and a few tender Amazon Lilies (*Eucharis Amazonica*) have been flowering all winter long. Those exotic woody plants regarded as hardy here never showed greater luxuriance. The Camellias produced a remarkably abundant crop of flowers. The hybrid Azaleas have been blooming now for nearly three months. Chinese Magnolias, Forsythias, Siberian Honeysuckles, *Photinia serrata*, Laurestinus and Daphne, with the Dutch bulbs, began to bloom on the first week of the new year and were quickly succeeded by *Magnolia fuscata*, Wistaria, and a profusion of Tea Roses, like Marechal Neil, Lamarck, Malmaison, Cloth of Gold, Sombreuil, and that everlasting bloomer, Archduke Charles, not to speak of the variety of herbaceous annuals and perennials which are now more than five weeks in advance of ordinary seasons.

In the last half of February car loads of Cabbages of the finest quality were shipped to northern markets. Irish Potatoes are now eight inches above ground, and the earliest varieties already show signs of bloom, and Strawberries are abundant. No one has ever seen the Japanese Medlars (*Eriobotrya Japonica*) bending under heavier loads of fruit, and no object could be more attractive to the eye than these trees now are with their golden fruits nestling among the dark green foliage. This tree is a prime favorite on the Gulf Coast, where, in warm, light loam, it finds a suitable soil and proves perfectly hardy. Seedlings spring up wherever the seed is accidentally dropped in raw soil, and such volunteers grow vigorously without cultivation and can be transplanted at almost any time of the year. The fragrant flowers of this tree open late in October and last nearly a month, and it is only in winters when there are long periods of cold, wet weather that it fails to produce fruit. The juice of the Medlar has a mild acid taste and an agreeable flavor, but it is not regarded as suitable for transportation to distant markets. It is my experience, however, that clusters freed from all defective fruit and packed in sawdust will carry without injury.

For the first time in ten years the Sweet Orange gives promise by its profusion of bloom of a full crop. The trees now coming into bearing are mainly those which sprouted from trees cut down by the freezing weather in the winter of 1880-'81. During the decade preceding the one just passed the orange crop was looked upon as the most remunerative one which could be grown in localities suitable for it. Some groves of small extent, on the shores of Mobile Bay, yielded an income of many thousand dollars a year, and therefore the cultivation of the Orange up to the disastrous winter was actively carried on. The fruit produced here, the Creole Orange of Louisiana and Mississippi Sound, leaves little to be desired in quality. Large, thin skinned, fair, finely colored, rich in flavor, with tender flesh and abundant juice which blends acidity with sweetness, all these qualities render it agreeable to taste, and superior to the fruit from tropical countries. According to the testimony of old settlers the cultivation of the Orange must have been more successfully carried on by the generation preceding the present than it now is. The reason, perhaps, is that years of destructive cold appeared at longer intervals. A frost in 1852 killed the orchards, as it did in 1880. The plantations that started anew from sprouts received a check during the winter of 1884, from which the trees mostly recovered and yielded crops up to 1880. It is to be hoped that since these freezing periods are so rare some means may be devised for protecting the orchards on these special occasions, now that we can be forewarned of the advance of cold waves by the Signal Office.

Turning to the woodlands, we find the deciduous trees and those with half persistent foliage, like the entire leaved Oaks, rapidly unfolding their leaves. The Cuban Pine has already shed its pollen. The Mock Orange (*Prunus Caroliniana*) has also bloomed; and so has the Ti-Ti (*Cliftonia ligustrina*). The Dogwood, Plums and Sparkle-berries (*Vaccinium arboreum*), the American Olive, Sweet Illicium and Haws are opening their flowers. The Mulberry and May Haw (*Crataegus*

astivalis) begin to ripen their fruits. The Loblolly Pine and Long Leaved Pine are unfolding their catkins weeks in advance of ordinary seasons. The Cherokee Rose is brightening up the wood borders and hedgerows with its flowers, while the yellow Jessamine, the Woodbine, the Cross Vine, the China-tree (*Melia azedarach*) and the Pomegranate are all in full bloom.

Mobile, Ala.

Carl Mohr.

Foreign Correspondence.

London Letter.

DISEASE OF ORCHIDS.—Some alarm has arisen amongst Orchid growers here in consequence of the appearance amongst Cattleyas of a very virulent and invariably fatal disease, the exact nature of which has not yet been determined. Some microscopists declare that there are clear evidences that the disease is caused by a Peronospora; others, on the contrary, are equally certain that the disease is not due to any fungus whatever, although a fungus may easily follow on the heels of the disease and be mistaken for the cause. About a year and a half ago a perfectly healthy plant of the autumn-flowering *Cattleya labiata* at Kew suddenly turned black and pulpy, as if it had been boiled. We were unable to account for this; no other Cattleya was attacked, nor have any been lost in the same way since. Examples of the same disease on *C. Hardyana*, *C. gigas*, *C. Dowiana* and *C. labiata* have been received at Kew within the last twelve months from expert cultivators, who were puzzled by the sudden collapse of plants which, until the disease appeared, were in perfect health. The whole of the material is in the hands of Professor Marshall Ward, whose report is anxiously looked forward to by hundreds, who are naturally dismayed by the ravages of this disease. Meanwhile it is interesting to note that an eminent fungologist at Kew experimented with the disease by inoculating a healthy plant and smearing another plant, also healthy, with some of the diseased tissue, the result being that whilst the inoculated plant turned black and rotted in three days, that which had been smeared remained apparently uninfected. The result of this experiment makes the disease, if not fungoid, still more mysterious. In one case reported to the Kew authorities there were two distinct plants of *C. gigas* growing side by side in the same pot, or what is known as a "made-up specimen," and whilst one of these was killed by the disease, the other remained uninjured, and is alive still. This disease must not be confounded with ordinary "spot," to which all Orchids are liable under certain conditions. At the last meeting of the Royal Horticultural Society specimens of Orchids affected with the first described malady were exhibited by a gardener, who was "anxious to know if there was any remedy, as he feared his collection was in danger of being destroyed." I do not believe there is any occasion for so much alarm, more especially after hearing from Professor Ward that the disease is not caused by a fungus.

LONDON FOGS.—Some time ago I mentioned the difficulties experienced by cultivators in the neighborhood of London owing to the frequency and poisonous nature of fogs in winter. The subject has since been taken up by the Royal Horticultural Society, with the result that the evidence collected shows the matter to be of so much importance that a government grant of £100 has been applied for to facilitate the investigation of the subject by chemists and physiologists. The present winter has been comparatively free from the black, or rather copper-colored, fogs, which during last winter did frightful injury to in-door plants of all kinds. We have a Smoke-abatement Society in London, but it does not appear to have any influence in the reduction of the smoke nuisance.

WEATHER.—We are experiencing now much colder weather than we had all through January. This morning, the 28th of February, the thermometer registered eight degrees of frost, with a cold east wind and snow falling. We have reason to feel grateful for this timely check to vegetation, which a month ago was so forward as to cause alarm for the safety of fruit and out-door plants generally. Notwithstanding the cold, the lawns have lately been bright with thousands of yellow Crocuses, Snowdrops, Winter Aconites and blue Squills. The effect produced at this time of year by these plants when set in thousands on sloping lawns is particularly good. Apparently they become established, for this is their fourth year on the lawns at Kew.

MOTH-TRAPS.—At a recent meeting of the British Fruit Growers' Association, Mr. T. W. Beach, who grows fruit very largely and is one of the principal jam-manufacturers in England, exhibited an excellent contrivance for trapping moths, etc., which infest fruit-trees. The trap is simply an

ordinary petroleum lamp, furnished with an extremely wide shade, the under surface of which is white, and covered with a mixture of grease and tar or any sticky substance. The moths are attracted by the light, and in flying about it they come in contact with and are held by the adhesive mixture. This simple but first-rate contrivance has been tried in several orchards with much success. To catch the enemy before it has sown the seeds of mischief is certainly a much more sensible way than to fight with the mischief itself.

TRADE-UNIONISM FOR GARDENERS.—The improved position of the followers of many trades and professions in England which has resulted from combination, has set gardeners to thinking whether something of the same kind could not be done by a union of a similar kind amongst themselves. The scheme propounded by the first to move in this matter is, briefly stated, an association for all professional gardeners; a registry of places and men; the boycotting of all who are not members of the association; the issue of certificates to all qualified gardeners, and the limitation of apprentices with a view to relieving the present very congested condition of the horticultural labor market. Whilst it is felt that, considering the nature of the training a man must undergo before he becomes a competent gardener, he is, as a rule, very badly paid, it is clear that so long as there are twice as many men as there are situations for them, there is small chance of a rise in gardeners' wages. There is small prospect, therefore, that the movement will prove very helpful. England is admittedly the best training ground for horticulture, and we are committed to free trade in labor as well as in everything else. Combination or a "strike" amongst gardeners would probably result in a loss to themselves, as horticulture is very much of a luxury, and a man cannot be compelled to pay more than he chooses for his luxuries. With the nurserymen it is different, and consequently nurserymen pay their permanent staff well, as they are bound to do. Meanwhile it is a curious commentary on the complaints of the gentleman's gardener that whilst he cannot command satisfactory wages, employers are at their wits' end to find competent men. Only this week I have been informed of three first-rate situations for Orchid-growers for which suitable men were not forthcoming.

London.

W. Watson.

Berlin Letter.

GERMANY is the land of societies, and it is no wonder, therefore, that at the capital of the Empire there are not only one or two, but half a dozen horticultural societies. The oldest and most important one of these is the Society for the Advancement of Horticulture in the Royal Prussian States. Its members are gardeners, amateurs and many botanists. It is the society which is now attracting general attention, from the fact that under its direction is to be held the great International Horticultural Fair, of which I wrote you in a former letter, and in which the decorative features of horticulture are to have the leading place.

Another old society, which is held in high esteem, is the Berlin Horticultural Society; its members are mainly nurserymen in the vicinity of the city. Then there are a Gardeners' Society, a Society of Commercial Florists, a Society of Fruit-growers, and a Society of Graduates of the Pomological Institute at Proskau. The gardeners of Berlin make a great deal of society life, but the activity of this life is confined mainly to the winter months, because in summer, work, in most of the nurseries, begins at four or five o'clock in the morning and ends at eight or nine in the evening. The number of nurseries where the work begins at six or ends as early as seven is very small. It is little wonder, then, that society life drags in the summer season.

The Society for the Advancement of Horticulture has monthly meetings, at which prizes are offered for special plants and discussions are held on subjects connected with them. Prizes were offered for groups of ten Amaryllis at the January meeting. Of three competitors, the head-gardener of the famous garden of the late Mr. Borsig gained the first prize, which was a large silver medal. His specimens were so vigorous, the flowers were so large and the colors so brilliant that they might well compete with the best English plants. The cultivator said that pot-culture was best for these bulbs. He transplants them but once during their period of vegetation, and thus gets strong bulbs, each of which bears two scapes with a pair of flowers. The second competitor showed seedling Amaryllis, and his practice is to plant the young bulbs out, whilst strong bulbs are cultivated in pots, plunged in warm soil four inches below the surface. Then the roots grow over the rim of the pot, and no further transplanting is needed. A

variety of *Clematis patens*, called Vesta and trained in balloon form, was exhibited at the same meeting. This beautiful white flowering plant was greatly praised by its exhibitor for winter bloom and cut flowers. Another good winter blooming plant shown was the new *Iris Bornmuelleri*, with yellow flowers. It was sent to the exhibitor by a collector in Persia, and it flowered in a cold frame in the middle of January. *Anemone blanda* was also shown and highly commended, because it had flowered in the open air in the last week of January along with Christmas Roses and *Eranthis hyemalis*. This, indeed, may be our earliest spring flower in the open air. Eranthis is flowering freely in the botanical gardens here, although the temperature fell below zero last week.

Specimens of *Lilium auratum* in flower attracted much attention. The bulbs are placed in an ice-cellar immediately on their receipt in autumn, where they are kept until needed for forcing. They are at once brought into a house with a temperature of from fifty-nine to sixty-four degrees Fahrenheit, when good sized bulbs will show four or five flowers in four weeks. The flowers are highly appreciated here in the winter months, and they are quite often seen in the flower-shops this winter. It has been supposed that they were imported from the Riviera like Roses, but this exhibitor said that other florists as well as himself raised many of them here.

The beautiful *Tulipa Greigi*, from Turkistan, is another flower which had been forced for exhibition. It began to bloom about the 20th of January and lasted for a long time. It was remarked, however, that the colors of the flower were not as brilliant nor the marking of the leaves as decided as when they were grown in the open air. It was stated that this Tulip, unlike most others, does not thrive well in a sandy soil, but needs a strong one, which does not thoroughly dry out in the summer-time. Deep planting is also necessary for its best development. One member stated that Tulips and Lilies gave the best seed when the scapes are cut and put in water to ripen. Under these circumstances the reserved nutrition is used for the development of seeds, while in the other case, where the scape remains on the plant, the reserved nutrition is carried downward to be stored in bulb. The question is one of sufficient interest to demand investigation, as was another made at this meeting, to the effect that in England some growers of Chrysanthemum-seed cut off the flowers and place them in water, thinking that in this way they get better seed.

Berlin.

Udo Dammer.

Cultural Department.

Notes on Strawberry Culture.

THIS year's fruit catalogues contain florid descriptions of many new and apparently desirable varieties of Strawberries, and it is quite perplexing to find that each one of these varieties is claimed to be of better quality than any other one. For many years I have been buying "the very finest of Strawberries." I have tested about twenty-five sorts, with a hope of reaching some day the climax of perfection, yet I sometimes doubt whether any Strawberry has yet been found which is better than the old Wilson's Seedling.

However, the Wilson seems to be declining in southern New Jersey, and I have now supplanted it with a sort which, with me, does better, known as the Pearl. This variety, as it grows here, is remarkably well rooted, of vigorous habit and of as good quality as any I have tried.

The quality of a Strawberry depends much on the soil in which it is grown, how the plant is manured and the weather under which the fruit ripens. Varieties which are excellent when grown under conditions favoring them, are comparatively worthless when these conditions fail. It is generally thought that the Strawberry requires high culture and fertilization with stable manure; yet this treatment will harm the quality of any variety of Strawberries. I have found Strawberries to do best on a fairly fertile soil, and fed with potash and lime, with no nitrogenous manures. If the plant be richly fed with nitrogen its fruit will be soft, flavorless and prone to decay. If treated with potash and lime it will be sweet and durable.

I once had a patch of Strawberries on new land which had not been manured. In the winter I top-dressed the field liberally with water-slaked shell-lime, spreading this on the rows so as almost to cover and hide the plants. A neighbor had a Strawberry-patch of like age and of the same variety—the Wilson. His land was freely fertilized with stable manure. One hot day I picked 400 quarts of strawberries and shipped them to Boston. On the same day my neighbor did likewise. My fruit reached Boston in good order and sold for a high price.

My neighbor's fruit reached there the same day, soft and unsalable. It did not bring enough to pay the freight. The difference in these berries was due simply to the differing effect of the stable manure and the lime. The same day that I sent these berries to Boston I sent a thirty-two-quart crate of them to friends in Kittery, Maine. This crate was on the road a day longer. The berries in it were selected, the largest and ripest, mostly dead ripe, yet these berries arrived in perfectly good condition, and my friends wrote that they were the finest they had seen.

The Wilson Strawberry, grown with potash and lime, and left to become dead ripe, is hard to beat, either for market or for the table; but nitrogenous manure will spoil it. It may increase the size of the berry, but it will be at the expense of sweetness and solidity. There need be no fear that liming the Strawberry-plant will injure it. Living vegetation is not harmed by the contact of water-slaked lime, though it will

tion. Not a berry ripened, and in the course of two weeks one could hardly find a green leaf in the whole acre. The plants died utterly.

Such complete destruction by this fungus is unusual; commonly only the leaves perish, and a new growth starts from the root-crown. This growth will in its turn become diseased from the fungus-spores which pervade the tissues they have destroyed. In these the spores of the fungus hibernate, and hatch with return of warmth and moisture in the spring.

I do not know whether lime will destroy the hibernating germs of this fungus, but from sundry experiences in its application I am disposed to think it will. However, it is known that lime prevents the germination of the summer spores of blight by which the disease is most rapidly spread. It is well to give the Strawberry-plants a liberal coat of lime in winter or early spring, and repeated lighter doses of dry lime before and after blossoming until the fruit is about one-third grown,



Montgomery Place: Entrance Front.—See page 139.

help decompose dead vegetable matter. I have covered Strawberry-plants two inches deep with slaked lime, and seen the plants grow up through it.

The Strawberry blight (*Sphaerella Fragariae*) may be prevented by a free and timely use of lime. All our varieties are more or less liable to harm from this fungus, which manifests itself in small purple or red spots on the leaf. As these spots increase in size they become a reddish brown, with a white spot in the centre. The leaves badly diseased turn brown, die and shrivel. This will be noticed especially where the fungus has attacked the petiole. Then the leaf will soon wither, though it may not be spotted. The fungus often invades the fruit-stems or the calyx. When this happens the growth of the berry is stopped. Moist and poorly drained soils and damp and "muggy" weather favor its rapid development. Years ago I had an acre of Crescents, carrying a heavy crop. When the berries were about one-third grown the field was struck by this blight, which swept over it like a conflagra-

tion. when the crop will be reasonably safe and the liming should cease or there will be risk of disfiguring the fruit should there be no rain to wash off the lime. The lighter applications of lime may be conveniently made with a bellows. It is only requisite to make a slight, but thorough, distribution of the dry powder over the entire surface of the plant. If the lime be on the leaf when the fungus germs alight on it they can do no harm. If the germs reach the leaf before the lime does, they will germinate and enter the tissues, and then the lime cannot affect them. The treatment of Strawberry blight can be preventive only.

Spraying the plants with a solution of hyposulphite of soda, one pound to ten gallons of water, is also preventive of blight. So is a solution of sulphide of potassium, one pound to forty gallons of water. The various formulated solutions of copper sulphate or carbonate are also preventive, but it must be remembered that all these chemicals are useful only as preventives of disease. The defense must interpose before the

attack arrives. Another preventive of blight is to burn over the berry patch. This destroys the seed of the infection. But the weather may prevent the doing of this at the proper time. In place of fire I use sulphuric acid, which acts like liquid fire. Spraying with a solution of one quart of the acid in twenty gallons of water will completely burn the vegetation and the fungus, and this can be done when convenient, regardless of the weather. I thus burned some rows of blight-infected plants in June, 1889. The new growth from the root-crowns remains healthy. I shall, however, again spray them with this burning fluid before the growth starts this spring, after which I expect to see no more of *Sphaerella Fragariæ* on these plants this season. This treatment is not expensive. The material will cost about fifty cents, and one may spray an acre of plants in an hour and a half.

mond toothed cultivator, then once hoed, some twenty plants reset, and afterward twice cultivated, one way only, leaving the plants in matted rows, which are matted enough. Three feet apart in a row is close enough to plant the Pearl, which is a strong runner. Even at four feet the rows will fill up with plants.

In December, 1889, this acre of Pearls was top dressed with two tons of Canada unleached ashes and a hundred bushels of lime. Next June I expect to harvest from it a healthy crop of berries which will bear transport to Canada.

When this crop is off the Strawberry sod will be plowed under and planted on the first of July to white Peach-blow Potatoes, fertilized with a ton per acre of "potato manure." Next year the ground may be again planted with Strawberries, which will be again manured with unleached ashes and lime.

Vineland, N. J.

A. W. Pearson.



Montgomery Place: An Avenue.—See page 139.

It is well to avoid damage from this blight by restricting Strawberry-plants to one crop. Make new plantations yearly. An acre of Strawberries may be planted almost as readily as an acre of corn. With ground in good order in April, mark it off three feet each way. Have the plants ready with roots straightened out and puddled. Use a broad bitted turving hoe. At the intersections of the rows strike this hoe into the soil at an angle of say forty-five degrees. Depress the hoe handle. This will open a gap in the soil beneath its blade. A man with basket of plants takes one of these, shakes its roots apart, and sticks them into the opening made by the hoe, so the crown of plant will be level with surface of the ground. The hoe is then withdrawn, the gap it made closes on the roots, the man with the hoe sets his foot on the plant, firming it in the soil, and proceeds to the next hill.

This seems a rough operation, but last April two men thus set an acre of five thousand plants in a half day. Two weeks after setting the rows were cultivated both ways with a dia-

Winter Notes on Trees and Shrubs.

THE general appearance of the stems and branches of deciduous trees and shrubs in our woods and gardens in winter is often of a very varied character and sometimes strikingly beautiful. The many pendulous, pyramidal and other so-called varieties of trees, which have been diligently propagated by nurserymen, are not more interesting than the diversity of forms to be met with in the fields, or more rarely in our open native woods. But when we regard the beautiful harmonies and contrasts of color of trunks and branches, occasionally produced in nature in what seems a haphazard way, the wonder is that effects of this kind have not been more extensively attempted in ornamental planting. The form of the trunk and the position and angle assumed by the bare branches of trees do not appeal to the eye of most people as do the colors of the bark, which, in many cases, cannot fail to attract the attention of even the least observing.

This is shown by the prominence given in many small gardens to the white-stemmed Birches, which Coleridge, referring to the European species, called the

——— "most beautiful
Of forest trees, the Lady of the woods."

In a great proportion of the species of our large growing trees, such as the Oaks, Ashes, Elms and Maples, the old and dead bark usually has a more or less brown or sombre gray appearance, except where vitality and color is given by mosses, lichens or other low forms of vegetable life upon it. The older parts of some species of Poplar are light in color; other trees, like some of the Beeches, have uniformly smooth trunks, and still others have the curiously blotched appearance of our Buttonwood-tree. A very few trees have stems whose bark retains some striking peculiarity of color after it has become inert and apparently of no vital use to the tree, but nearly all show green or some brighter color in the younger branches.

Of the White Birches, already referred to, a common one in New England gardens is the native *Betula populifolia*, which never becomes a wide-spreading tree or more than thirty or forty feet high. In the poor soils in which it is most often found it usually occurs in thickets and shrub-like clumps. Planted against a dark or evergreen background it is certainly conspicuous, with its white stems and dark green, slender branchlets. Of weeping and other forms of White Birches propagated by nurserymen, those of the European species (*B. alba*) are the most common, and, it may be added, generally the most interesting and graceful.

A much more beautiful tree in every respect is the Canoe Birch (*B. papyrifera*), and it is perhaps never so strikingly attractive as when its large, shining, pure white trunk is seen mixed with the dark hued stems of other trees in its native woods. Where it has room to develop it sometimes becomes a beautiful, broad-spreading tree whose coppery bronze colored branchlets form a curious contrast with the dazzling whiteness of the older bark. Few deciduous trees have a greater charm than this when leafless, but, like its other white stemmed congeners, its beauty is best shown by contrast. One other species is conspicuous in the woods in winter, the Yellow Birch (*B. lutea*) having its trunk covered with loose, thin, curling flakes of silvery or yellow bark. The charm of this is lost when the tree is growing in exposed situations, as the bark then becomes dull-colored or weather-beaten.

Next to the Birches some of the Willows attract attention by the yellow, red or bright green of their branches, the colors of which deepen with the coming of mild days in late winter and early spring. A few shrubby species are particularly showy, both by the color of their bark and the half developed catkins which they bear. One of the most pleasing, as well as one of the most rare, native species is *Salix balsamifera*, of the White Mountains, and further northward, which has clean, glossy russet, yellowish brown branches, and reddish buds.

Among all our hardy trees, there are none which in color possess more delicately pretty stems and branches than the small Striped Maple (*Acer Pennsylvanicum*) of our northern woods. Without having the glaring prominence of the White Birch, the beautiful striated bluish white and green or brown marking of the smooth bark of this tree at all seasons makes it a desirable one for any lawn. Good specimens are rarely seen in cultivation, but when well grown they are trim and ornamental little trees. Some other Maples may have more brightly colored branchlets than this species, but they lack the peculiar charm of its stem. The same observation applies to the Lindens, some of the propagated varieties or forms of which are noted for the golden yellow, bright red or other colors of their twigs, while the bark of all the older parts becomes gray. The showy colors of the twigs of tall, upright growing trees, however, do not usually attract the eye as do those of dwarf and spreading habit, or shrubs.

Of the latter, a few species of Dogwood are certainly among the most conspicuous, and are usually planted for the color of their stems, and, in popular esteem, they occupy a place among the shrubs equal to that of the White Birch among the trees. The white-fruited Dogwood (*Cornus alba*), of Siberia, is the most conspicuous as well as the most generally cultivated, both in this country and Europe. The deep, blood-red color of its stems and branches, which becomes richer as spring approaches, makes a brilliant and striking show at any time, but is naturally most prominent when the ground is covered with snow. There are several horticultural forms known to nurserymen under the names of *Sibirica*, *Atrosanguinea*, etc., having stems of varying shades of scarlet or red, besides those with peculiarities of foliage; and, unfortunately, in many

catalogues the species is given as *Cornus sanguinea*, a name properly belonging to a larger growing European species having little of interest in the color of its bark, which becomes gray when old. Next to the Siberian species our native *Cornus stolonifera* possesses the bright scarlet twiggled quality in a high degree; and the branches of the Silky Cornel (*C. sericea*) have a more or less purplish hue. When judiciously planted, a selection of these and some of the dwarf Willows, besides several other shrubs with peculiar color of bark, would do much to brighten our winter landscapes. J. G. F.

Arnold Arboretum.

Cœlogyne cristata.

THERE are over one hundred species of *Cœlogyne* known to botanists, but not one of them can compare in popularity with the subject of the present note. Indeed, *Cœlogyne cristata* must be regarded not only as the finest representative of the genus to which it belongs, but also as one of the best known and most generally cultivated Orchids. Not only does it take precedence of all other *Cœlogyne*s in these respects, but it is also interesting as being the first species upon which Dr. Lindley established the genus in 1825. Its appearance in cultivation dates from the year 1837, when it was successfully introduced from the mountains of Nepal by Dr. Wallich. It is a native of this and the surrounding regions of north-eastern India, where it has been found growing on rocks and trunks of trees at elevations varying from 5,000 to 8,000 feet above sea level. In 1841 it was first publicly exhibited by Mr. Barker, of Birmingham, to whom was awarded a silver Knightian medal at one of the spring meetings of the Horticultural Society of London.

The typical *C. cristata* is recognized by its globose or oblong pseudo-bulbs, which vary in size from a small green-gage to a large hen-egg. They are produced in great masses at intervals of one, two and three inches on a strong rhizome thickly covered with imbricating, brownish scales. On the summit are borne two oblong-lanceolate leaves, nine to twelve inches long, the upper surface of which is deep green, the under surface being much paler. The pendulous or arching scapes are produced from the base, and are clothed with sheathing bracts. Each scape usually bears from five to eight flowers, measuring three to four inches across, and of the purest white color with the exception of an orange-yellow stain on the disc of the lip. The oblong sepals and petals are undulate on the margins and more or less twisted at the tips. The lip is three-lobed, with rows of erect, comb-like fringes on the orange-yellow disc. The second and fourth of these rows are much longer than the others, and form a solid, erect and more or less toothed plate in front. The column is pure white and slender, furnished on each side with a thin wing, which becomes wider toward the apex, where it forms a kind of shelter to the bluntly beaked anther. The front lobe, as in nearly all *Cœlogyne*s, has two sunken, converging lines which almost form a triangle in the centre.

There are a few distinct varieties of this species known, chief among them being *Alba* or *Hololeuca*, which differs from the type in having absolutely pure white flowers without a stain of yellow. It usually blooms a month or six weeks later than the type. The variety *Citrina*, perhaps better known as *Lemoniana*, is characterized by having a delicate wash of lemon color on the lip instead of orange-yellow. The *Chatsworth* variety is noted for its strong habit, having very large pseudo-bulbs. The flowers are similar to those of the type in color, but are larger in size and have the sepals and petals less twisted. *St. Albans* variety, or *Maxima*, as it is often called, may be said to be even more robust than the *Chatsworth* variety, and to have somewhat larger flowers, with much less twisted sepals and petals and a broader lip.

Cœlogyne cristata is best grown in large, shallow pans, furnished with holes underneath and at the sides. Three parts of their depth should be filled with clean crocks, over which must be placed a layer of rough, fibrous peat and moss. Above this comes the mixture of rich, fibrous peat, by itself or mixed with a little loam, in which the plants will freely grow. During the spring and summer months liberal supplies of water may be given as the plants are growing, but the quantity must be diminished as the bulbs are getting mature. Then the flower-spikes begin to push forth, but it is not until nearly two or three months afterward that the handsome blooms expand. During the season of flowering—that is, in December, January and part of February—very little water need be given until the growths begin to appear again, which is usually about March. If specimen plants are required, repotting will be unnecessary until two or three years have elapsed, by which time the pseudo-bulbs will have become

much crowded, and will require thinning out. The winter temperature for this species should vary from fifty-five to sixty-five degrees, Fahr., and a few degrees more in the summer.

St. Albans, Eng.

John Weathers.

The Spring Garden.

THE earlier flowers are usually most uncertain in their time of blooming, but this season they have carried their vagaries to the extreme, and began to bloom in the first days of the new year. In planting a garden one usually has an eye to effective combinations and harmonies, and while in the early garden these pleasant pictures are often slightly disturbed because some plant fails to contribute its color at the anticipated time, I have never before known such a revolutionary change in the schedule. Snowdrops in a southern border were showing color on the first day of the year and were soon after in full flower. Owing to the comparatively low temperature there has been a succession of flowers for quite two months, and, in fact, a few lingering ones were snugly buried under the snow last week. Two months of Snowdrops means much pleasure to a lover of flowers, for those exquisitely lovely flowers, usually the first harbingers of spring, have a purity, delicacy and freshness all their own. Elwes' Snowdrop (*Galanthus Elwesi*) is the most satisfactory variety for the border, since it is very much larger in all its parts than *G. nivalis*, and slightly earlier. More conspicuous it is, too, though not at all coarse. The buds of *G. Elwesi* are comparatively shorter and more round than the elegant pointed buds of *G. nivalis*. This is an Asia Minor variety, originally found by Mr. H. J. Elwes, and, as it has become plentiful, it should have a place in every garden. No garden ever had an overstock of Snowdrops. Plant them thickly and let them alone to make nice clumps. Like many of the small spring flowers, they require time to become established in masses and effective. For the collector of curiosities there is a number of varieties of *Galanthus* (perhaps a dozen or so), differing more or less widely, but as many of them are so nearly alike that experts seem to have difficulty in their separation, the difference in some cases must be very fanciful. The great curiosity in the family is *Galanthus nivalis Octobrensis*, which, as its name implies, blooms in October. This variety is excessively rare.

Viewing with the Snowdrops in earliness of bloom, a little colony of *Anemone blanda* has given me great pleasure and is still showing its bright flowers with foils of charming foliage—"each spray," a friend says, "a bouquet of itself." This *Anemone* is also from Asia Minor, and a true winter-flower, by which I understand one that will pass unharmed when in bloom through the severest weather, a distinction I was trying to make against the Hellebores not long ago in these columns. Collected forms of *A. blanda* range in color from deep blue to white. They bloom almost as soon as they appear above ground, and they appear as soon as the surface soil is free from frost. The foliage is deeply cut and has a bronzy hue which is very attractive. *Anemones* are not usually happy in my garden, but this species bids fair to be as satisfactory as it is beautiful. Without doubt it should be counted a first-rate addition to the earliest blooming plants. A cheerful plant is the old Winter Aconite (*Eranthis hyemalis*), with its bright yellow flowers within their green collar. These plants gave a flush of color in February which was all too short. They are somewhat slow to become established, but are very hardy, very dwarf, and good things to tuck into the front of a crowded border, where they will be undisturbed.

Elizabeth, N. J.

J. N. Gerard.

Kohl Rabi.

THIS is a vegetable of peculiar habit of growth and a curiosity to many, as I have found when offering it for sale. The leaf of the plant resembles the leaf of the Cabbage, and it grows out of the sides and centre of an enlarged root that lies on the surface of the ground, a round mass varying in size and usually three inches in diameter. The root has the texture of a turnip, with the flavor of a cabbage. The early White Vienna is well and favorably known as a tender and rapid-growing variety; but the red or purple color is only a superficial difference, and the flesh of all varieties is nearly white, and when not overgrown very tender. When old the fibre of the root extends upwards, first on the outside and then through the heart of the vegetable; a thick rind taken off at first will remove all the fibre, but when the root is filled it is useless.

The best practice is to plant seed in succession for use, because after the bulb has begun to form the period in which it is edible is comparatively short. It is very easy to grow, and

is less affected by the attacks of the cabbage-worm than other members of the Cabbage family. The seeds for the first crop should be planted about the first week in March and treated in all respects like Cabbage, setting the plants in the open ground as soon as Cabbages can be set. The growth in rich land will be rapid, and a second planting a month later will make a succession. For fall use, sow in open ground early in July. My practice is to transplant, but this is not necessary, as the plants can be thinned where they grow to about six inches apart, having the rows two feet apart. They bear transplanting and extremes of heat and cold or drought well. In fall the unused plants are taken up, and, after the leaves are cut off, are set with the root in earth in a cellar, where they will keep well into the spring months, and be as good as when harvested.

To prepare for the table a common method is to pare, cut in cubes of about an inch square, boil till tender, and then serve with drawn butter.

Hampden County, Mass.

W. H. Bull.

Symphoricarpos racemosus, var. pauciflorus.—This dwarf variety of the common Snowberry in its natural home is usually a low, diffusely branched little shrub growing on rocky banks, sometimes in the sunlight, but oftener in the shade or partly shaded situations. The flowers and fruit are neither numerous nor conspicuous, but the dense light green foliage, which seems to retain its freshness throughout the season, is quite pretty, and the plant seems to thrive in a thin and poor soil when most others would not. In its native home, where the soil is very thin, it is often no more than six inches high; but these same dwarf plants attain a height of fifteen to twenty inches in one season when transplanted into the nursery. It thrives well under cultivation, producing larger foliage and a longer growth of branches. *Shepherdia Canadensis* is another shrub more difficult to transplant than the dwarf Snowberry, but frequently growing with it. It is never so abundant, but it has many valuable qualities. The usual height of this shrub is about four feet. The flowers are dioecious, and, when not in flower or fruit, it is almost or quite impossible to distinguish the male from the female plants. The yellowish red fruit comes before autumn, and, though it remains ripe on the plants only a few days, it adds much to their beauty. The foliage, nearly smooth and green above, covered with rusty scabs underneath, is pretty on the wild plants; but when these are established in the nursery it becomes much larger and more beautiful. On the headlands of Lake Champlain this shrub is quite common, usually along the margins of half shaded cliffs overhanging the water.

Southwick, Mass.

F. H. Horsford.

Seasonable Hints.—Cold frames should be uncovered every fine day and carefully ventilated at all times, or the result will be spindling and enfeebled plants. As soon as the ground is sufficiently dry—that is, when it can be readily pulverized with spade and digging-fork—shrubs, small fruits, hardy herbaceous plants, and the whole line of dormant roots in the kitchen-garden, like Asparagus and Rhubarb, should be transplanted. When Strawberry-plants show signs of returning life, remove the mulch a little from around the crown of each plant, so as to allow the young leaves space to develop. If the bed has no mulch it will pay to apply it even now.

If the lawn was neglected last fall, a light dressing of thoroughly rotted manure, or, better still, some of the standard commercial fertilizers, should be applied. This is the time to sow nearly all the vegetable and flower seeds which should be started under glass. Tomatoes, Peppers, Egg-plants, Cabbage, Cauliflower and Lettuce should be sown in the hot-bed without delay, and three seeds each of Cucumbers and Melons should be placed in a three-inch pot, and the strongest one only allowed to develop.

Pansies may be had for late flowers by sowing seeds now, and for succession a month later. Plants may be had in this way almost as good in September as in April. They require a heavy, rich soil that retains moisture well, and when signs of exhaustion are shown they should be treated with liquid manure. A mulch of sphagnum moss, through which has been mixed a small quantity of pure bone-meal, say two pounds of the meal to one bushel of the moss, will produce abundant bloom.

Cannas should be separated and potted now. The new so-called dwarf varieties, which are really ever-blooming, are among the most effective plants of recent introduction. Tuberous Begonias are growing in favor for garden culture, and they should be started at once, as also should Gloxinias, Caladiums, Achimenes and the like.

Bergen, N. J.

P. O.

Correspondence.

Prairie Forestry.

To the Editor of GARDEN AND FOREST:

Sir.—Allow me to make a brief rejoinder to Professor Keffer's remarks in regard to forestry on the plains, in your issue of March 12th. To be sure, without tree-planting in a treeless country, there can be no forestry; yet, while trees and the planting of trees is the necessary basis for forests and for forestry, it should be now understood and urged that the planting of trees alone does not constitute forestry, and unless the work is done with a certain knowledge, and in accordance with certain principles of forestry proper, it cannot produce the results—or at least the full results—which are anticipated. It is the manner of planting which constitutes the difference between mere tree-planting and forest-planting. What we do now on the prairie in regard to forestry bears the same relation to forest-planting proper that the crude, unscientific scratching of the ground for a food-crop, by the Indian or Mexican, bears to the highly intensified methods of the New Englander or European. In a measure and in a manner results are obtained, but neither in a full measure nor in the best manner.

The first and the lasting object and leading thought of the forester is to create and maintain forest-conditions. Such conditions are afforded by dense growth, mixed growth and undergrowth, which combination alone can shade the ground effectually and continually. In order to maintain such forest-conditions it is not enough to plant densely and plant mixed growths; we must know what the component parts of our plantation will do in their further development, how they will grow up in relation to each other; how, in fact, they will keep up forest-conditions and develop into a desirable wood growth; we must plant with a foresight into the future of our plantation, if we wish to deserve the name of forest-planters. To do this we must have a knowledge of the life-history of our forest-trees, their requirements, their rate of growth and development during the various stages of their life.

I have no fear that we will not learn all this in time, but so far we know but little about forestry methods as applied to our forest-trees, and even the little knowledge we do have in this direction finds no widespread application in practice, and I must consider it unfortunate that this is so, and that tree-planting is so often considered synonymous with forestry.

I hope I have made clear my proposition—that it is the absence of forestry principles and forestry methods and not the deficiency in volume of planting which deprives our tree-planting in the west of its right to the title of forestry, although, in the end, for climatic effects, the volume alone will tell. I agree most readily with Professor Keffer that it is the enormous evaporation and dissipation of moisture, due to the unchecked winds much more than to the deficient rainfall, that makes agriculture precarious on the western plains, and hence the more need of creating extensive forests and forest-conditions in that region.

Washington, D. C.

B. E. Fernow.

Orchids at Flatbush, Long Island.

To the Editor of GARDEN AND FOREST:

Sir.—In the neighborhood of Flatbush and Brooklyn several good collections of Orchids can now be found, and, as if to refute the notion that Orchids can only be grown in a house especially built for them, we find them in Palm and Fern houses, and growing with luxuriance in company with these plants. I lately saw a fine show of bloom in the houses of Mr. William Brown, of Flatbush. As is usual at this season, *Cattleya Trianae* made the most striking display, with many well flowered specimens in the best condition and in several very distinct and attractive varieties. A plant of *C. Gaskelliana*, in full flower, was very noticeable, being entirely out of season, for a species whose normal period of bloom is in the months of July and August. Mr. Bennett, the gardener, states that this plant blooms regularly at this season, which makes it a valuable acquisition, and, moreover, it is deliciously fragrant. Among the Dendrobiums were some large and well flowered examples of the old, but still popular, *D. nobile*, and hanging from the roof was a fine piece of the pretty *D. Devonianum* carrying 200 flowers. Other species, such as *D. Wardianum*, *D. thyrsoflorum* and *D. fimbriatum*, were equally well flowered.

The Phalænopses in this collection are very thrifty, and many fine and well branched spikes were seen of the beautiful *P. Schilleriana*; also several good forms of *P. amabilis*, *P. Sanderiana* and *P. Stuartiana*. From the roof hung a fine

piece of *Dendrochilum glumaceum*, bearing forty spikes of its fragrant blossoms, and several plants of the pretty *Oncidium sarcodes*, attached to blocks, had produced well branched spikes loaded with yellow and brown spotted flowers, and forming a delightful combination with the other occupants of the house. *Phajus Wallichii*, too, was in fine condition. *P. grandifolius* was just past flowering, after having made a grand display for several weeks.

A number of well grown Cypripediums added to the display, including, amongst others, the white flowering *C. niveum*, large plants of *C. Boxallii*, *C. villosum*, *C. hirsutissimum*, *C. Harrisianum* and *C. Stonei*. Several plants of note promise a fine show of bloom later in the season, among them being remarkable examples of the true Majus form of *Oncidium ampliatum*. This grand species is always an attractive object when in bloom, bearing great quantities of golden yellow and brown spotted flowers on its many branched stems. Several plants of *Oncidium Papilio majus* were also showing, together with *Cymbidium eburneum* and *Zygopetalum crinitum*. The *Nepenthes* in this collection are always worth a visit, being in fine health. Among them was a good plant of *N. Amesiana*, with several enormous pitchers; also *N. Rafflesiana*, a splendid, well furnished plant of *N. Tildeniana*, with excellent examples of *N. Dominiana*, *N. Craigiana*, *N. Hookeriana*, *N. Sheltonii*, *N. Bennetiana* and many others.

Summit, N. J.

A. Dimmock.

Specimen Plants at Wellesley.

To the Editor of GARDEN AND FOREST:

Sir.—In the *Gardeners' Chronicle* for February 8th mention is made of a remarkable *Cymbidium eburneum* twenty years old, which produced twenty-seven flowers a year ago; and in the next issue of the same paper two plants of *C. Lowianum* are mentioned, one of which had 140 and the other 108 flowers.

It is the common opinion that there are many Orchids grown on the other side which surpass any grown here; but if every remarkable specimen in American collections was accorded a public notice we might find that the superiority of the Old World in this respect is not so marked as we had supposed. Just now in the collection of Mr. H. H. Hunnewell, at Wellesley, Massachusetts, there is a *C. eburneum* with no less than nineteen flower spikes, and one of three large plants of *C. Lowianum* shows 141 flowers, one-half of which are fully expanded. A striking plant is *Medinilla magnifica*, and one not often seen nowadays, though it is by no means new. The specimen, here, a standard with a stem five feet high and a head seven feet in diameter, has thirty-three racemes of flowers, and is an object of great beauty. Perhaps these plants are worth putting on record, and it is to be hoped that other gardeners will follow with notes on some of the treasures in their charge.

Wellesley, Mass.

F. L. Harris.

A Gardener's Problem.

To the Editor of GARDEN AND FOREST:

Sir.—Mr. Burbidge, in his letter at page 117 of the present volume, conveys the idea that Mr. Moore's treatment of *Nepenthes Rajah* may be quoted in refutation of the views of Mr. Watson; but, perhaps, Mr. Moore had better be allowed to state his own experience. In a paper on "Experiments with Manure in Orchid Culture," read before the Scottish Horticultural Association on January 7th of the present year, Mr. Moore is reported as follows: "Many experiments which have been made, and from which important results have accrued, would never have been undertaken but for the failure of some favorite plant or set of plants. A case in point is *Nepenthes Rajah*; thrice I got this plant, twice I lost it, and the third plant now flourishes. When I obtained it first I was recommended to grow it, if possible, in hot vapor, advice which was frequently repeated to me afterward; but treating it as nearly as I could to these instructions, ended in the death of the plant. On the second occasion I was recommended to grow it in cold vapor; was speciously informed that it could not fail with such treatment; that the fact had been amply demonstrated. Again I adopted the advice given, and again I lost my plant. On the third occasion I merely begged a plant, but did not beg advice; I considered long how I would treat it, my inclination leaning strongly to the hot system. Eventually, I determined to try a "betwixt and between," and brought it to the cool Orchid-house, where there was a moist atmosphere with a minimum night temperature of fifty degrees Fahrenheit. In this house it grew apace, and, what is more important, continues to grow and flourish, so that it is

now a fine, vigorous plant, each succeeding leaf being larger than that which preceded it."

I would infer from those remarks that Mr. Moore succeeded simply by following the bent of his genius, and quite independent of any knowledge he may have possessed of the Bornean climate. The experience of Mr. F. L. Ames' gardener, as reported on page 108, would also point to the minor importance of minute knowledge regarding habitat in this particular case.

Cambridge, Mass.

M. Barker.

Native Shrubs in a Mild Winter.

To the Editor of GARDEN AND FOREST:

Sir.—Thoreau, who was a very keen observer, says, in his journal, that he does not remember to have seen the buds upon indigenous shrubs prematurely started by mild weather in winter.

This statement has been verified during the past season, so far as I have had opportunity to examine. While plants of exotic origin, such as the Japan Quince, the Syringa, European Cornels, Lilacs, Clematis, etc., have awakened to a dangerous degree under the warm sun of January and February, the native Cornels, Alders, Clematis, Virginia Creeper and others remain safely inactive—though growing sometimes side by side with the former.

This is a singular and somewhat significant fact, suggesting, perhaps, that the indigenous growths have inherited, from an ancient line of ancestry, a sense of the fickle and dangerous character of the wintry airs of New England; and that their spring openings, accordingly, are regulated by dates more than by temperatures. Does the rule hold good also among herbaceous perennials? I found *Phlox decussata*, Sedum, etc., an inch or more above ground in February, while such natives as *Trillium grandiflorum* and *Aster Nova Angliæ* keep quietly in bed for a season yet.

It would be interesting to hear from those whose opportunities for wide observation in this particular are of more value than mine. Among the larger plants I do not find the rule applying as fully. The White Maples were allured into thrusting out their tiny and beautiful blossoms in February, and the buds of the Red Maple, American Elm, Beech and some others have been considerably swollen for some time. The Maples are always a sensitive race, however, as the sugar makers are well aware—the others mentioned are not yet, I think, sufficiently advanced to receive injury, even from zero weather.

Dorchester, Mass.

E. S. Farwell.

The Tulip-Tree from Seed.

To the Editor of GARDEN AND FOREST:

Sir.—I wish to raise a quantity of young Tulip-trees (*Liriodendron tulipifera*), and should like to know how to proceed in order to get them from the seed. I sowed some seeds last year and not one came up.

Bucks County, Pa.

S. R.

[As a rule, about one seed in ten of this tree will germinate, and even this limited fraction of the whole never sprouts till the second year. Mr. Jackson Dawson's plan is to take a box of good size and fill it with seed and fine sand in alternate layers, and then bury the box in a well-sheltered place, and leave it there one season. The next spring the box is lifted, the seed is taken carefully out, sown thickly in rows and covered lightly. Mr. Dawson read a paper on propagating trees and shrubs from seed at a meeting of the Massachusetts Horticultural Society on March 7th, 1885. The paper was published in pamphlet form, and it contains information of practical value to every one who wishes to raise seedling-trees or shrubs.—ED.]

Periodical Literature.

Only a few years ago references to our vanishing forests were rare in print, and were principally confined to scientific journals. But to-day one can hardly take up a newspaper or magazine without finding some insistent plea for forest-preservation, based on definite knowledge of the damage which has already been done and a lively sense of the imminent greater damage to come. An example in point is an excellent article called "The Forestry Problem," by Mr. Charles Morris, published in the February issue of *Lippincott's Magazine*. The facts it cites are chiefly drawn from the Census reports of 1880; and bad as they are, the reader would be

shocked indeed had it been possible to gather data as full to-day, and to contrast the ruin of 1880 with the wider ruin of 1890. Of course the subject is too familiar to our own readers to justify an abstract of Mr. Morris' article. We need only quote one paragraph as touching upon a cause of injury which is, perhaps, less justly estimated by the public than the lumberman's axe and the camper's fire. This is the forest-browsing of animals. "It is common in the southern Atlantic States," says the writer, "and in California to turn cattle, sheep, horses and hogs into the woods to pick up there a scanty subsistence. The result is the destruction of seedling plants in immense numbers, while young trees, and often old ones, are killed by the loss of their bark. Hogs add to the ruin by rooting up the young Pines and feeding on their succulent roots. . . . At the opening of the dry season in California immense herds of cattle, horses and sheep are driven into the mountains to graze, and from the foot-hills to the highest alpine meadows not only every blade of grass, but also every seedling tree, is destroyed. The present forests await the axe, but the hopes of future forests are ruined. Nor is this all. The sharp hoofs of the sheep, winding up the steep acclivities, tread out the roots of the grasses and other perennial plants; the soil, deprived of its vegetable covering, is washed away by the rains; and not only is the possibility of future forests destroyed, but the fertile plains below are threatened with burial under the gravel and sand swept from the bare mountain-sides."

In *Harper's Magazine* for March Mr. Charles Dudley Warner humorously deplores the recent rise of the Chrysanthemum in fashionable favor, and thinks it imperative upon him to declare that it is less beautiful than the Rose, and to predict that after a while the Rose "will become again the fashion and be more passionately admired for its temporary banishment." If he had consulted facts instead of his own imagination, he would have known that, despite this vogue, there was never a time when Roses were so largely in demand as now. Chrysanthemums have not pushed them out of favor; they have merely won themselves a place which, before they came, was empty; for, as Mr. Warner might have remembered, the Chrysanthemum season is the very season when Roses are at their worst and it is most difficult to obtain them. In early summer they bloom for us out-of-doors; in winter and spring the hot-house supplies them; but in autumn what did we have before the Chrysanthemum was a favorite? Moreover, there are Chrysanthemums and Chrysanthemums, and while we often see flowers with little but size or eccentricity to recommend them, multitudes of varieties are truly beautiful in form as well as color. It is quite unjust to say in a general way that the Chrysanthemum "goes along with all the conceits and fantastic unrest of the decorative art" of the moment, and "helps out our age of plush with a flame of color." Is it not the favorite flower of the Japanese, who, above all other peoples, are remarkable for sobriety in household adornment? Of course it can be misused, but so can the Rose itself; and if any flower may be taken as an emblem of the extravagance and display which too often characterize American homes and entertainments, one could more justly cite the costly hot-house Rose, despite its sentiment and its "capacity of shyly and reluctantly unfolding its beauty," than the cheap Chrysanthemum, although it may be true that "there is nothing shame-faced or retiring about it."

Recent Plant Portraits.

Botanical Magazine for February:

PODOPHYLLUM PLEIANTHUM, t. 7098; a native of Formosa, and a near ally of our Mandrake or May Apple, from which it differs by its axillary flowers and isomerous stamens and petals; and is also interesting in departing from its congeners in having numerous deep purple colored flowers. *P. pleianthum* was discovered in 1881 by Mr. T. Watters, and was introduced into England from the Hong-Kong Botanic Garden in 1885 and flowered at Kew in August last year.

COTTONIA MACROSTACHYA, t. 7099; a small-flowered Indian Orchid of considerable botanical interest, although the flowers are not showy or of much value from a decorative point of view.

DROSER A CISTIFLORA, t. 7100; the most beautiful of all the cultivated Sundews, with bright scarlet flowers. It is a native of the south-west corner of south Africa, whence living plants were introduced to Kew by Miss North, the distinguished botanical artist, whose gallery of flower paintings, made in all parts of the world, is one of the chief popular attractions of the Royal Gardens.

CHIRONIA PALUSTRIS, t. 7101; a south African representative of the Gentias, with rosy pink flowers, and distinguished from

the other species of the genus in its strongly twisted anthers, approaching in this way the European *Erythroca*. It was introduced into England by seeds collected in south Africa by Mr. William Watson in 1887.

CYPRIPIEDUM ROTHSCILDIANUM, f. 7102; a native of New Guinea, whence it was imported by the Messrs. Sander & Co., of St. Albans, a few years ago. The editor, Sir Joseph Hooker, discussing the antiquity of the genus *Cypripedium* and the variability of individuals of the same species, takes occasion to say: "The subject of the antiquity of a genus or group of plants is a very attractive one, and far too complex to enter on here. Such antiquity, when leading to extinction, is supposed to result in fixity of type, in rarity of individuals, and in the restriction of these in area. In respect of it I may allude to the singular fact that though *Cypripedium* is one of the few tropical genera of Orchids that inhabit both the eastern and western hemispheres, it has not hitherto been found in Africa or Madagascar, countries which have on plausible grounds been held to have been the most recently peopled with plants."

Notes.

The annual spring exhibition of the Pennsylvania Horticultural Society will begin at Horticultural Hall, Philadelphia, Tuesday evening, March 25th, and continue until Friday.

At a recent meeting of 700 under-gardeners held in Berlin a unanimous vote was given in favor of an eight-hour labor law, and of setting apart the first of May as an annual workmen's festival.

The most interesting "congress" that will form a feature of the great horticultural exhibition to be held in Berlin this spring will undoubtedly be the meeting of students and growers of conifers which is announced for the 28th of April.

Jasminum nudiflorum has been opening its blossoms sparingly nearly all winter in Central Park, and last week the long wands thickly studded with blossoms could be seen in many places above the snow. While the plant at this season lacks foliage, the contrast of the flowers with the dark green color of the bark is very pleasing.

One of the best known flower painters in Europe, Anton Hartinger, died recently at Vienna in his eighty-third year. His chief work was the preparation of water colors for reproduction in costly books, the last upon which he was engaged being an atlas representing the flora of the Alps to accompany the text of Professor Della Torre.

Mayor Hart, of Boston, has written to city forester Doogue requesting him to make flower-beds on the Common and in the Public Garden which shall imitate in form and color the United States flag, the Massachusetts coat of arms, the seal of the City of Boston, and the badges of the Loyal Legion, the Woman's Relief Corps and the Sons of Veterans. And yet it has been asserted and believed that Boston is a city of culture and refinement.

The Department of Agriculture has recently issued a circular, prepared by Mr. Fernow, which is sent out with the tree seeds that are distributed. The circular gives in brief such suggestions as to the raising of forest-tree seedlings as will be helpful to those not familiar with the practice. Of course the entire theory of raising trees from seed cannot be given in three pages, but the elementary principles seem to have been carefully elucidated so far as the space will permit. The care of seedling-trees in the nursery is to form the subject of another circular.

To illustrate how Peas are influenced by the soils in which they grow, Professor Bailey, in a late bulletin, gives these facts concerning a plot of Golden Gem Peas in the garden of the Cornell University Experiment Station. The rows began in a good rich loam and ran into a stiff and strong clay. A good sod had been turned under a few days before the Peas were sown. The ends of the rows were so dissimilar at picking-time that they appeared to be planted with different varieties. The average height of the plants in loam was eighteen inches; average number of pods to the plant, five and a half; all the pods, except sometimes the very uppermost ones, were ripe, and there were no flowers. The plants on clay were larger, deeper green, with more bloom, and a tendency, not apparent in the other case, to produce two pods on a peduncle. The average number of pods to a plant was seven; only about two-thirds of the pods were ripe, and there were still some flowers.

A young Englishman, in business in Manilla (one of the Philippine islands), interested himself at odd times in growing Orchids, collecting *Phalænopsis* and *Ærides* from the wilds, and fastening them to a tree-trunk in his garden. He sent small pieces to his friends, but only partial success attended these distant exportations. He therefore determined to cut down a tree and export the trunk with these epiphytes thickly growing all around it. The trunk came to England safely, with the clinging little plants all about it, full of life, after a journey of some 10,000 miles, and it may now be seen in the stove greenhouse of Mr. J. Andrews, Manilla Lodge, Fallowfield, standing five feet high and three feet in girth, as a trophy-column to the tact and discrimination of this young amateur. A correspondent of the *Northern Gardener*, who tells this story, adds that the handsome leaves and thick roots almost hide the bark of the trunk; and for general healthfulness he doubts whether anything in the country can equal it.

Dr. Fisher expresses a doubt whether the bee is at best the enemy or the friend of the seed-grower, as he is largely both, for without his work in carrying pollen the fruits of dioecious plants would not be fertilized, and without it, also, his mischief in mixing new varieties with inferior sorts would not be accomplished. It is true that he will give a dose of cucumber flavor to a crop of cantaloupes, if the two sorts of *Cucurbitaceæ* happen to be planted near neighbors; but, then, he offsets his bad work by producing new varieties which are sometimes of very great value. This work may be better and more wisely done by the horticultural philosopher, who acts designedly by combining size and hardness on the one side with delicacy and productiveness on the other. This form of lottery has a few grand prizes, but a far greater number of small ones and blanks; the uncertainty of the drawing adds to the interest of the investment. The farmer oftener than the philosopher offers a new variety which the little bee has helped him to produce the year before, and of which he has known nothing until his eye has discovered the distinguished stranger among his melons, cucumbers or other ground fruits.

In a recent bulletin from the Cornell University Experiment Station, Professor Bailey states that the Crandall Currant, which was supposed by its disseminator to be a hybrid between the Missouri Currant and the common Red Currant, is really a variety of the Buffalo or Missouri Currant (*Ribes aureum*), with no indications of hybridity. It does not appear to be a well fixed variety, some of the bushes on the experiment-grounds yielding berries but little larger than the common Red Currant, while others bear fruit five-eighths of an inch in diameter. The plant seems variable also in its time of ripening. The bushes are vigorous growers, need more room than ordinary Currants, and seem now more free from insect depredations. The fruits are fair, polished, bluish black, easily separated from the stem, and therefore picked singly like gooseberries or cherries. Their flavor is agreeably sweet, but lacks character, but has none of the grossness of ordinary black currants. This currant is good for culinary purposes, both when green and ripe, and for jellies it is preferable to the ordinary kinds. The variety is quite distinct, representing a new type of small fruit, and when further selected and improved must become a staple.

The portrait of a splendid specimen of *Eucharis Amazonica* with 220 blooms is published in a late issue of the *Gardeners' Chronicle*. It was grown in the gardens of Mr. G. F. Linden, of Birmingham, and shows such exceptionally good cultivation of a plant which is often difficult to grow successfully, that the methods under which it was produced are worth attention. The specimen was grown in "soil composed of good loam, a little leaf-soil, some broken sandstone, and a few half-inch bones, with plenty (quite six inches) of drainage to allow water to escape freely." The roots were found to adhere to the sandstone and evidently derived benefit from it. "The plant was kept through the winter and spring in a temperature of sixty to sixty-five degrees, but was removed when it flowered to a cooler house, in which, if kept too long, however, the foliage suffers and decays. Very little water, and that manure water, is used directly on the soil, and then only in hot weather; but the foliage is frequently syringed with clear manure-water, used freely in the growing season, and the plants are never allowed to dry off." Mr. Bluck, the gardener who produced this specimen, thinks that too much soil in the pots and too much water at the roots is injurious to *Eucharis*, and he trusts more to the copious syringings with weak manure-water than to anything else to secure these results. Diseased bulbs of *Eucharis*, sent to this garden, were washed and placed in a pan of sand with sphagnum at the bottom, when they grew freely and were soon restored to health.

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"A Gardeners' Problem."

IN the latest number of the *Gardeners' Chronicle* received here the editor announces that the entertaining, though somewhat roving, discussion which has covered whole pages of our valued contemporary ever since the year began, is now brought to a close "in the absence of any new evidence on either side." Since the reverberations of the controversy have been heard in our own columns, it may not be inappropriate to state just what this "Gardeners' Problem" is which has aroused the botanical talent of the old world into such general activity. The *Kew Bulletin* for December last contained an important report by our correspondent, Mr. Watson, on tropical and sub-tropical plants grown in the open air in southern Europe, and this was prefaced by a note in which Mr. Dyer, Director of the Royal Gardens, said: "Horticulture is essentially an empirical art. Botanical science can afford little *a priori* information as to the cultural conditions which any plant will require or tolerate; these for the most part can only be found out by trial and experience." This paragraph was pronounced by Dr. Masters as discouraging to those who believe that practical horticulture has a right to look to vegetable physiology and anatomy for guidance and for profitable suggestion, and he added that the statement of Mr. Dyer was too absolute. These, so far as we now remember, were the most positive declarations ventured on either side, and the various disputants assumed positions somewhere between these extremes, and usually about equidistant from each. The problem, from its nature, does not admit of demonstrative reasoning, and therefore remains unsettled. This fact, however, does not deprive the discussion of a genuine value, for each writer endeavored to illustrate some phase of the question by examples of plants in actual cultivation, so that a body of experience has been collected which will prove of assistance to all who are interested in the practice or theory of horticulture.

In studying the argument in the case of Empiricism *vs.* Botanical Science, it may be worth while to remember that knowledge is knowledge, whether it is acquired by cultivating plants or by studying them in some other way. Any one who attempts to build a sustained argument based upon the

assumption that knowledge which is practical can be separated by a distinct line from knowledge which is scientific, will be likely to come to grief. We do not mean by this that there was a general confusion of terms in the discussion of this gardeners' problem, but it seems like drawing a rather fine distinction when it is said of an author that he speaks as a gardener on one page and as a botanist on the next, and that in the one case his utterances, drawn from the stores of his empirical knowledge, are helpful to the cultivator, while in the other case his counsel, based on scientific knowledge, has no practical value. When it is stated that the gardener who has a genius for his work will "naturally hit upon the right method" of cultivation; and again, that the good gardener will "know instinctively" what treatment to apply in a given instance, this means that the gardener has been doing just what the man of science would have done if he had been engaged in research in the same field. He has been making deductions, classifying, generalizing. What is called his instinct is the result of reasoning from data gathered by observation, and his conclusions may be strictly logical, although he has never thought of formulating them.

In regard to the general question it may be said that in this country there are some persons who are apprehensive that farmers and gardeners will be unfitted for the practice of agriculture and horticulture if they are subjected to instruction in the sciences related to these arts. The foundation of so many agricultural colleges, with chairs of horticulture, would seem to indicate, however, that what the country at large is afraid of is not too much science, but too little. It is true that very many of the marked advances in agricultural and horticultural practice have been made by actual workers in the field who have found by experience that certain methods and processes could be improved upon. These steps forward have not been due, as a rule, to men of science, but it is equally true that science has always been ready to present the reasons for the change, and in this way to suggest the most hopeful lines for further improvement. It seems to our people that a man who knows why he adopts a given method of cultivation is likely to be a more practical cultivator, less likely to fail in the essentials of the practice, than one who blindly follows the rule of thumb. Horticulture and agriculture, too, are no doubt largely empirical arts; but we sympathize with Dr. Masters in the belief that the addition of scientific knowledge will help to place them on a foundation more sure and productive than that of individual experience.

We cannot expect that every farmer and gardener will become an expert in vegetable physiology, but it is reasonable to hope that intelligent cultivators will acquire so much of the elements of the science as are set forth, for example, in Professor Johnson's treatise, "How Crops Grow," and there need be no fear that the little knowledge thus gained will prove a dangerous thing. Neither farmer nor gardener needs to be so well schooled in chemistry that he can make a quantitative analysis of a soil, or of a food ration, or of a fertilizer; but he should know enough of this science to be an intelligent student of the current literature of the experiment stations. Indeed, one can hardly visit a farmers' institute in this country without hearing the more successful farmers talk intelligently about nitrogen, phosphoric acid and potash, or of carbohydrates and albuminoids, and these farmers will testify that this elementary knowledge has directly improved their practice. The students of mycology and entomology have rendered incalculable benefit to horticulture by discovering remedies for plant-diseases and destructive insects, and the gardener and farmer are certainly better equipped for an encounter with the black rot of the Grape or with the curculio, if they know enough of the history and habits of fungus or insect to understand why a given method or a given season is selected for the application of the remedy. And so we might go through the entire list of sciences related to horticulture, and fail to discover one, an elementary

knowledge of which would not prove of distinct advantage to the gardener or farmer.

There are, no doubt, gardeners, as there are men in other walks of life, whose practice is hampered or misdirected by what they think they know; but it is hardly fair to lay the blame for such failure at the door of science.

• Legislation Against the Gypsy Moth.

WE believe that the bill looking toward the extermination of this insect, now before the Massachusetts Legislature, should receive favorable consideration. The caterpillar of the Gypsy Moth is known to be a destructive pest in the gardens and orchards of Europe, and it has evidently, within the twenty years since its unfortunate introduction into Medford, obtained a firm foothold, and unless it is repressed, it will perhaps spread throughout New England and the Northern and Central States. The amount of \$25,000 asked of the General Assembly will, a few years hence, seem a not extravagant sum, should the insect be at once exterminated, a matter not difficult of accomplishment, if the suggestions made by Professor Fernald in his pamphlet issued by the Massachusetts Experiment Station are carried out.

The chief value, however, of this particular measure would be that it might lead to the passage of a general act against insect depredators. Massachusetts has been liberal in the publication of illustrated works on injurious insects, such as Harris' Treatise on Insects, and the amounts expended in this direction have been a good investment. The General Government, too, has made liberal grants to the State Experiment Stations; but unless the people of each state co-operate in applying the practical remedies against these pests, they will continue to be an exhaustive drain on the resources of farmers and fruit-growers. Had the Legislature of Massachusetts in the early part of the century passed acts, with suitable appropriations, against the tent-caterpillar and canker-worm, how much desolation of orchards and loss of shade-trees might have been prevented! Even now, every June as one travels from Boston to Portsmouth, or in any direction from Boston, he beholds ravaged orchards and leafless trees, which look as if a fire had passed through them. A few orchards are saved, and it has been again and again demonstrated that with a little care and slight expense an Apple orchard can be easily preserved from the attacks of caterpillars. But when a few keep these pests away by the use of simple preventives, their careless neighbors take no precautions and suffer their shade-trees and orchards to be worm-ridden. The result is that the worms are transported by the winds over fences from infested Elms; the females climb over fences, and thus vitiate the best laid plans of the more public-spirited planters. A law compelling the indifferent or careless to co-operate in staying and preventing the ravages of these pests might accomplish a great deal toward reducing their numbers. And why should there not be legislation against insect pests, as well as game-laws or dog-laws or acts against allowing cattle to run at large or permitting noxious weeds to go to seed?

Whatever may be the tendency to over-legislation in our country, it is a reasonable course to compel every landholder to co-operate in preventing these insect ravages; for if the owners of leafless orchards and defoliated shade-trees are permitted to maintain insect-nuisances, they will defeat every effort of their more enterprising neighbors who are willing to take measures for protecting their trees.

The Cypress of Montezuma.

THERE appeared not long ago in these columns (volume iii., page 2) an account of the deciduous Cypress (*Taxodium distichum*), with a view of a swamp in southern Indiana covered with a forest of these trees surrounded by their peculiar root growths, the so-called Cypress-knees.

The illustration on page 155 of this issue represents the trunk of a tree of the same species and one of the most interesting and best known trees in America, the "Cypress of Monte-

zuma," the largest of the famous Cypress-trees in the gardens of Chapultepec, near the City of Mexico, and a noted tree nearly four centuries ago. It belongs to the same species as our deciduous Cypress of the Southern States, which extends southward through some of the high valleys of Mexico nearly to Guatemala, growing in these southern stations in comparatively dry ground, and without producing the knees which characterize the more northern trees, the inhabitants of deep swamps and inundated river banks. The "Cypress of Montezuma" is a tall and still graceful tree, rising to a height of 170 feet, with a trunk to which different travelers have ascribed a girth varying from forty to nearly fifty feet, the discrepancies in the measurements being due, no doubt, to the different points above the surface of the ground at which they were made. It stands near the hardly less famous spring, the "Bath of Montezuma," the source of the water supply of the Aztec capital, to which it was carried on a splendid aqueduct of 900 arches.

The tree of Montezuma is only one of a number of individual Cypress-trees growing in different parts of Mexico, famous for their antiquity, their vast dimensions and the historical associations which cluster about them. Distinguished naturalists* have examined their history and computed their age, which, in the case of the "Cypress of Montezuma," has been estimated to be about seven centuries; while that of the larger tree of Santa Maria del Tule is believed to be nearly 2,000 years old. This tree, the largest deciduous Cypress of which there is any authentic record, stands in the centre of the village of Tule, on the road from Oazaca to Guatemala by the way of Tehuantepec, within the enclosure of the parish church, and is a conspicuous object from all the country round. The measurements of this tree given by travelers vary a great deal, and it is difficult to compare them satisfactorily, as they generally lack precise information of the exact manner in which they were made. The latest measurements of this tree which we have seen were made a year ago and are as follows: Circumference of the trunk five feet from the ground, following all its sinuosities, 146 feet; actual circumference five feet from the ground, 104 feet; total height of the tree, 150 feet; longest diameter of the trunk, forty feet; shortest diameter of the trunk, twenty feet; spread of branches, 141 feet.

Hardly less famous than the Cypress of Santa Maria del Tule is the Ahuehuate of the village of Atlisca, near Puebla, of which the worthy Archbishop wrote three centuries ago, as quoted by Gray: "The cavity of the trunk might contain twelve or thirteen men on horseback; and that in the presence of the most illustrious Archbishop of Guatemala and the Bishop of Puebla more than a hundred boys entered it." This tree, according to Humboldt's measurements, had in his time a trunk girth of sixty-six English feet, the cavity of the trunk being about sixteen feet in diameter.

"El Arbol de la Noche triste," the Tree of the Night of Sorrow, another of the great Mexican Taxodiums, stands in the little village of Popatela. It marks the spot where the soldiers of Cortez went down like sheep before the Aztec hordes, their backs to the foe. The trunk of this tree girths about sixty feet, and although the top and many of the branches are in a state of advanced decay, the tree still rises above the little church close to which it stands and which was built to commemorate the battle.

Our illustration of the trunk of the "Cypress of Montezuma" is made from a photograph taken by Miss A. L. Rotch, of Boston, to whose kindness we are indebted for its use.

Holiday Notes in Southern France and Northern Italy.—XIII.

NEARLY twenty miles south-west of Nice is the pretty town of Cannes, a wonderful horticultural centre. The principal promenade is that of La Croisette, which, as far as the beauty of the trees is concerned, is preferable to the famous Promenade des Anglais at Nice. Date Palms alternate with *Platanus acerifolia*, and here and there large Oleanders are thriving between their more majestic neighbors. The Planes do remarkably well close to the sea. Apparently self-sown, high up in the chinks of rocks and walls on the way up to Mont Chevalier, *Solanum glaucum* was perfectly at home, growing very freely and flowering abundantly. From the top of the hill just named a series of fine views are obtained, especially of the Iles de Lérins, in the largest of which, Ste. Marguerite, that mysterious individual—the man with the iron mask—was confined from 1686 to 1698. In our own times, Marshal Bazaine

* Humboldt, "Essai Polit. Nov. Esp.," ed. 2, ii., 54.—A. De Candolle, in *Bibl. Univ. de Genève*, xlvii., 392.—A. Gray, "Scientific Papers," ii., 113.

was imprisoned here from December, 1873, until his escape in August of the following year.

Orange-trees are largely grown at Cannes, principally for their blossoms; the real centre of the Provençal perfumery distillation is, however, at Grasse, about a dozen miles inland from Cannes. Cassie (*Acacia Farnesiana*) is also extensively cultivated on the hills outside Cannes; the plants are kept pruned in like large gooseberry-bushes.

One of the glories of Cannes is the beautiful *Acacia dealbata*, which, as described so charmingly by Alphonse Karr, has "for leaves the finest ostrich plumes, and for flowers great golden thyrses." Enormous quantities of the flowering branches of this species are forwarded during the winter months to the Paris, London and other markets, and as the flowers stand traveling well and last a long time, they can be bought at a cheap rate from the costermongers in the streets of London and the neighboring towns. The soil of Cannes is a micaceous schist which suits this *Acacia* admirably; at Nice and elsewhere along the Riviera, wherever limestone abounds, it obstinately refuses to grow. According to Alphonse Karr, a line a yard wide, drawn between the territory of Nice and that of Cannes and St. Raphael, marks the boundary where the soil suddenly changes in character; on one side of this line the *Acacia* in question luxuriates in company with tall Heaths (*Erica arborea*)—three yards and upward in height—which in January are covered with white blossoms, exhaling a perfume that partakes of the character of vanilla as well as that of bitter almonds. On the Nice side of the line neither this *Acacia* nor Heath can even be made to grow.

Fine Stone Pines and Cork Oaks form striking objects in the Villa-gardens on the hill-sides, and in uncultivated ground the underwood is Myrtle, Heaths, spiny members of the Broom family, Smilax, Phillyrea, Lentisk, *Lonicera Caprifolium*, Cistus, etc.

Solagnac's establishment on the "Californie Hill" is the most important and best managed of the gardens mainly devoted to the culture of plants on a large scale for cut flowers. Terrace after terrace—many of them only just broad enough for the long houses filled with Roses, etc.—are kept up by stone walls and rise in long series one above the other. Peaches, grown as bushes, gave promise of a fine crop of fruit, and underneath them were planted such things as *Iris Susiana*, *Gladiolus Colvilli* and other bulbous plants with showy flowers. Large quantities of Mignonette were coming on—sown toward the end of August, the seedlings had four or five leaves the third week in September and would begin to yield a crop of flowers in December.

The favorite Carnation was "Enfant de Nice," a sturdy, compact grower, with fine flowers, white, with a blush-colored centre. The two Strawberries grown by Solagnac are Victoria and Dr. Morère. Probably some of the readers of GARDEN AND FOREST will remember the fine dishes of the latter variety exhibited at Paris—in the horticultural exhibition from May 24th to May 29th, in connection with the exposition—and the statement written on the card, that the fruit had borne a journey of about 630 miles.

The Roses were nearly all Teas, and were planted out on the terraces above mentioned. During the summer months the lights are taken off and are only replaced at the end of September. Comparatively little pruning is necessary, the long, vigorous shoots being tied down in a more or less horizontal position. Some 8,000 lights were piled in blocks at the time of our visit; the supports and framework of the houses—at any rate, those in which the Roses were grown—were made of pitch pine, unpainted. Excellent arrangements, some of them very ingenious, existed for a copious water supply on all the different levels in this thirsty spot, and everything evinced the pride the proprietor feels in his garden. Not a weed was to be seen, and all the plants were healthy and well grown.

After leaving Cannes, we passed St. Raphael in a ravine on the coast. Then comes a romantic rocky district with numberless Mulberry-trees and vineyards in which Phylloxera was playing sad havoc. The Olives were pollarded as in Languedoc, and looked stiff and formal in comparison with the beautiful trees on the Italian Riviera. Fields of Tuberose just coming into flower were passed here and there. Along the coast heaps of snowy salt marked the spots where in the low, marshy grounds the sun's rays had been utilized for procuring this necessity of life from the sea-water by evaporation.

But my holiday was nearly over, so a comparatively short stay was made in Marseilles; another stop at Lyons, not long enough to make my scattered notes worth recording here, and then a rush to London to resume duty after nearly a month's absence.

Kew.

G. Nicholson.

Entomological.

A Newly Imported Rose Saw-fly

(*Emphytus cinctus*, L.)

ONE of the natural and inevitable results of the great increase in importation of plants, bulbs, etc., from foreign countries is the introduction with the plants of some of the insects which live upon them. These insects may also be introduced in other accidental ways, and, like some foreign weeds, it frequently happens that the immigrants thrive better and prove more troublesome in their new surroundings than in their native home.

The importation of an additional enemy of the Rose has now to be recorded, and whether or not it is to be as troublesome as some of its predecessors remains to be proved. In the summer of 1887 I found a number of Saw-fly larvæ, which I had never observed before, on the under side of the leaves of several species of Rose at the Arnold Arboretum and on a few horticultural varieties of the Rose in some gardens in the vicinity. In the following summer and autumn the larvæ were quite plentiful, and they were found in the Botanic Garden at Cambridge as well as in the Arboretum and other gardens in Boston. I do not know how much further their present range extends, but it may be safely stated that in the localities mentioned, and where the injuries by Saw-fly larvæ were noticeable during the seasons of 1888 and 1889, fully one-half of the defoliation of the Rose-bushes was caused by this imported species, the remaining portion of the injury being chiefly the work of the well known Rose-slug (*Selandria Rosa*, Harris).

The difference in the character of their depredations may be readily seen, as the larva of the imported Saw-fly generally begins at the edge and eats all parts of the leaf to the thick part of the midrib, whereas the Rose-slug usually devours the green tissues of the leaf only, and leaves a more or less perfect skeleton of it. The larva of this newly imported Rose saw-fly also has the habit, when at rest on the under side of the leaf, of curling up its body into a close spiral or ball, with the anal segments resting on the middle part of the body, a position never assumed by the common Rose-slug.

The fully grown larva is about three-quarters of an inch long, smooth, cylindrical and tapering slightly from the head. The head is dull yellowish orange in color, with a brownish or blackish stripe down the middle of the top, and with black eyes. The color of the body is a metallic green above, though sometimes pale; and the lower part of the sides, the under side of the body and the legs are grayish white. Above the spiracles there is a dark spot, which, in some stages of the larva, appears as a dark stripe along each side of the body; and there are other spots close above the legs.

It was not until the autumn of 1888 that a few perfect saw-flies were raised from these larvæ, and, at first being supposed to be a native species, it was some time before they were identified. Finally, after reference to descriptions of European species, there seems to be no doubt that this is *Emphytus cinctus*, L., a species known to occur over the larger part of Europe and to extend into Siberia.

The color of this Saw-fly is shining black; antennæ, black; thorax with two very small white points (cenchri) behind the second pair of wings; abdomen, a little longer than the head and thorax together, and, besides a somewhat triangular white blotch behind the thorax, there is a conspicuous yellowish white band on the fifth segment of the females, which is absent in the males. This white band does not quite encircle the body, but terminates abruptly after passing around the sides, leaving the middle of the under side of the segment black. Of the legs, the femora or thighs are dark brown or black, with white on the upper part; and the tibiæ are whitish at the apex, the rest of the tibiæ and the tarsi being reddish. The length of the largest specimens (females) is about three-eighths of an inch, and the wings, which are transparent, expand five-eighths of an inch or slightly more.

The ordinary observer may instantly distinguish these insects from the common Rose Saw-fly by their much larger size (two to three times as large) and this white band on the body of the female. They are also much more active than the common black species, of which Dr. Harris says ("Insects Injurious to Vegetation," p. 525), "when touched they draw up their legs and fall to the ground."

The eggs are deposited singly on the under side of the leaves. The Saw-flies may be found hovering about the Rose-bushes early in May, and some larvæ continue to feed until late in October. There are certainly two, possibly three, broods during the season.

Curiously enough, this insect has been considered by some

European observers as a Rose stem-borer, because the larvæ have been found in Rose stems; and, in a "Rose Supplement" to the *Gardeners' Chronicle* for July 7th, vol. viii. (1877), a figure (Fig. 8) is given of this insect under the name of the "Rose stem-boring Saw-fly," in which the Saw-fly itself is well represented, but the figure of the magnified larva shows that it must belong to some other species, as it is covered with bristles or hairs, whereas the larva of *E. cinctus* is smooth. The truth seems to be that the fully grown larvæ, in search of suitable places in which to undergo their transformations, often select the pithy part of the Rose-branches and stems where they have been pruned off and exposed. They never bore independently through the hard, woody part of the stem, and never go deeply enough into the pith to cause serious injury to the stems of the plant. Like the Cornel Saw-fly recently noticed (vol. ii., p. 520), they also select very soft or decaying wood in which to hibernate and pupate. As is the case with many other species of Saw-flies, this one is said to be parthenogenic. Fortunately, the remedy for this possibly troublesome pest is easily procured and applied, and thorough applications of hellebore at the right times will clear the bushes of all larvæ.

The insect was described and well figured by the late Dr. S. C. Snellen von Vollenhoven (*Tijdschrift voor Entomologie*, viii. [1865], p. 73, pl. 3), and a translation of the text by J. W. May was given in the *Zoologist* (Newman's) for 1870, p. 1,993. In Europe an ichneumon, *Cryptus emphytorum*, Boie, is known as a parasite of this Saw-fly. J. G. Jack.

Arnold Arboretum.

New or Little Known Plants.

Aster ptarmicoides.

THIS pretty little Aster, of which a figure appears on page 153—the first which has been published of it—is hardly known in gardens, although, while it is not one of the showiest of the American Asters, it is one of the prettiest and most graceful of them all, and therefore well worth a place in the herbaceous border or in the rock-garden. It is especially well suited to plant among the crevices of rocks, for its natural place of growth is in such situations where it is found from western New England to Minnesota, and then westward to the Saskatchewan country and the mountains of Colorado.

Aster ptarmicoides is a dwarf, rigid plant, the wiry stems varying in height from six to twenty inches, or growing rather taller when planted in rich garden soil. The leaves are lucid on the two surfaces, linear, or the lower ones somewhat spatulate, and three or four inches long. The flowers, which are produced in corymb-shaped cymes, are white.

Aster ptarmicoides was discovered by Mr. Thomas Nuttall near Fort Mandan, on the Missouri, before it was known to be an inhabitant of New England. Botanists have had different views in regard to this plant at different times during the last fifty years, and it has been referred by them to no less than six different genera. A taller and more slender variety of this plant (var. *Georgianus*) has been found in north-west Georgia and in Arkansas.

Foreign Correspondence.

London Letter.

THIS week has been one of extremes as regards weather. It began with a heavy fall of snow accompanied by a sharp frost, until the thermometer fell to ten degrees, or twenty-two degrees of frost. So low a temperature in March has not before been known here within the last fifty years. Wednesday, the fifth, brought a south-west wind and sunshine, and on Thursday the temperature at midday was fifty-five degrees in the shade. Whilst a little cold was wished for to check too forward vegetation, so much as twenty-two degrees when fruit-trees are in bud and even in flower means disaster.

Amongst the plants now in flower at Kew the following are noteworthy:

TACCA ARTOCARPIFOLIA.—This is a most remarkable stove-plant. Tacca is a genus of about nine species, three only of which are known in cultivation: *T. (Ataccia) cristata*, recently noted in GARDEN AND FOREST; *T. pinnatifida*, enonomically interesting, its tubers being described as "resembling new

potatoes" and the fucula from them being known as South Sea Arrowroot (it is also largely used in the same way as Sago for puddings, etc.); *T. artocarpifolia* is the largest of the three. From its tuberous root-stock spring numerous leaves on stalks three or four feet long, the blade two feet across and divided into stalked pinnatifid segments. The flower scapes are erect, six feet high, and each one bears a whorl of leafy bracts surrounding a cluster or umbel of numerous green-brown flowers, which are stalked and elegant in arrangement. Probably the most attractive feature is the numerous long arching brown filaments which spring from amongst the flowers and hang over Medusa-like. This species is a native of Madagascar. It requires plenty of moisture, rich soil and a tropical temperature all the year round. It is not what one would call beautiful; still from its elegant, stately appearance and the extraordinary character of its inflorescence it should rank amongst select plants for cultivation in large stoves.

GODWINIA GIGAS.—I noted this plant when it flowered at Kew last year, and merely mention its flowering again now because hitherto it has not flowered two years in succession. Until the introduction of *Amorphophallus Titanum* Godwinia was far and away the most gigantic of all cultivated Aroids.

CHAMÆDORÆAS.—More than thirty species of Chamædoreas are cultivated at Kew, both in the small houses and in the large Palm-house, where they are effective as well as useful as undergrowth to the large Tree-Palms in the beds. They are even more ornamental in a house devoted almost exclusively to Tree-Ferns, large Aroids and the most striking of the *Marantaceæ*, the Chamædoreas being planted amongst the large leaved Anthuriums and Philodendrons for the sake of contrast and elegance. In addition to the feather-like charm of their foliage there is also the decided beauty and delicious fragrance of their flowers, which are developed freely at this time of year on branching, drooping spikes, in clusters below the head of leaves. In some of the species the flower spikes are not unlike those of the Meadow-Sweet and are quite as elegant. In others, as for instance *C. Ernesti-Augusti*, the female plants bear long unbranched spikes with numerous bright red flowers, the whole spike afterward changing to a coral-red color. Few people think of growing Palms for the sake of their flowers, owing to the fact that most of these plants can never grow to flowering size in ordinary plant houses. But Chamædoreas are exceptions in this respect, as they flower when less than six feet high; indeed, *C. tenella* and *C. pygmaea* are the most diminutive of Palms, flowering and fruiting when only a foot high. *C. scandens* and one or two others are remarkable as climbing species, a character which renders them available for clothing large pillars or growing against the trunks of the largest Palms.

CAMELLIA RETICULATA.—A very fine bush of this large flowered species is now one of the chief attractions in the winter garden at Kew. Camellias have, as a rule, little to recommend them except the stiff symmetry and color of the flowers, but this big flowered species differs from them sufficiently to gain the admiration of the most artistic of flower-lovers. Along with size—for the flowers measure as much as nine inches across—there is the charm of looseness and elegance in the curve and arrangement of the petals, in which characters no two flowers are alike. Then the color, a deep rosy red, with the bunch of golden stamens showing through here and there, is most attractive. The leaves are stout and leathery, not shining, whilst the conspicuous reticulating nerves give them a character by which the plant is easily recognized. According to Mr. Hemsley the proper name for this plant is *C. spectabilis*. It has been in cultivation here about fifty years.

CANTUA DEPENDENS.—There is no more beautiful greenhouse climber than this, but it has a bad reputation in gardens because of its generally falling a prey to red spider and rarely flowering well. When fortunately situated, however, it makes a magnificent show whilst in flower, its elegant trumpet-shaped, bright red flowers hanging in loose corymbs from almost every branch. The finest example I have ever seen was growing against the back wall of a lean-to greenhouse with a south aspect, the Cantua being planted in a border of peat at the foot of the wall. It flowers in the spring. A plant of it is now in flower in the conservatory here.

A NEW HYBRID PHAIUS, raised by Mr. N. Cookson, of New-castle, its parents being *P. Wallichii* and *P. tuberculatus*, is, perhaps, the most interesting Orchid in flower in England at the present time, which is saying a good deal for an Orchid, a hybrid, too. But the plant is of exceptional beauty, both in color and form, whilst in constitution it appears to have inherited the sturdiness and free-growing character of the female parent, *P. Wallichii*. We believe that it is only three years since the seeds were sown from which the plants now flowering

Fig. 27.—*Aster ptarmicoides*.—See page 152.

were raised, and that they have grown vigorously is shown by the strength of the flower-spike and vigor of the foliage. An inflorescence recently sent to Kew by Mr. Cookson had a scape a foot long, and it bore five flowers which were fully four inches across, the segments similar in form and arrangement to those of *P. Wallichii*, two inches long, half an inch wide, their color pale rosy salmon shaded with brown. The lip is almost campanulate, spurless, two inches long, three-fourths of an inch across the mouth, with a tongue-like lobe nearly an inch long, wavy and crisped along the margin. Its color is apricot-yellow, changing to deep crimson in the upper part, whilst the lobe is purple with a yellow line running down the middle from throat to apex. The column is white.

CYMBIDIUM LOWIANUM.—Two gigantic specimens of this noble Orchid, both good varieties, the one bearing thirteen spikes with 320 flowers, the other 211 flowers, nearly every one expanded, have just been sold at auction for twenty-eight guineas and thirty guineas respectively. It is rarely that one meets with such perfect examples as these were. They were in pots about one foot three inches across, and the soil they were growing in was a strong loam simply. Although one of the easiest of Orchids to cultivate, yet this *Cymbidium* does not always flower satisfactorily. It is an open secret that both plants were purchased for the great establishment at St. Albans.

C. LOISE CHAUVIERI.—A plant under this name was offered at the same sale, and although a small example with a single growth, the sum of forty-two guineas was refused for it. The name is said to be Reichenbachian, though there does not appear to be any record of its having been published. Mr. Sander sold two plants of it, the only others known to exist, to Sir Trevor Lawrence about eight years ago, but they have not yet flowered. In the sale catalogue it is described as "a large flowered scarlet variety from Madagascar, the finest new Orchid in existence." A *Cymbidium* with large scarlet flowers would be a grand addition to garden Orchids. Meanwhile we may note that there are no species of *Cymbidium* hitherto recorded from Madagascar, a fact which, however, goes for very little, seeing how few of the plants of the interior of this island are known.

W. Watson.

Kew.

Cultural Department.

The Cantaloupe.

OF the various members of the Gourd family, those which interest us generally are the plants which supply our tables with delicacies, of which the Cantaloupe has the greatest number of admirers, and, in the estimation of some, it has no equal among our summer fruits. To constitute perfection, the fruit should be removed from the vine shortly before it is ripe; it should be washed with soap and cold water, then dried in a soft towel, and set to ripen in a dry place. A Cantaloupe that before washing smells like a potato, will in a few hours begin to give out an inviting perfume, and when this odor has reached its proper measure and character is the time to cut the melon.

My own ideal melon is of the size and form of a large ostrich-egg, with a thin, finely-netted rind, thick, grass-green flesh, a small seed cavity and a sweet, aromatic flavor. Some fifty years or more ago there was introduced into this market a small, green-fleshed Cantaloupe known as the "Centre Melon," which, for a time, excelled in richness of flavor all of its competitors. It was flat in form, grooved and finely netted; but it was too little to suit the ideas of the trucker, and therefore had to be made larger by hybridization with other flat varieties of greater diameter but inferior flavor. This Centre Melon was the progenitor of the Jenny Lind variety named about 1846; but where it came from no one now appears to know. I am inclined, however, to believe that it originated in the East, and possibly in the table-land of Armenia, where netted, green-fleshed melons are produced in abundance, some of which are flat, and where the same perfect flavor is to be met with. These Armenian melons

belong to a hardy race, are quite productive in our climate, and can stand it quite as well as any of our own kinds; they are as yet entirely unknown to our seedsmen, but have been grown under the severe test of the season of 1889. In form they are flat, globular or oval, the last being seven inches long, and all are fine-grained, thin-rinded, green-fleshed and closely netted, the last an unusual feature in our own varieties last year. This oval Cantaloupe has come nearer to my ideal than any one I have yet tested, and I hope to give it a better trial this coming summer. As Oriental seeds always come mixed in the packages, it will take time to separate the varieties by selection. As I have discovered Erzeroum, in Armenia, to be a great melon centre for both Cantaloupes and Watermelons that are calculated to stand our hot summers, it is to be hoped that our enterprising seedsmen will take steps to secure a full line of seeds, and particularly since my twenty-six kinds of Watermelon seeds were all lost in the wet ground.

The Cantaloupe has largely multiplied in its varieties in our country of latter years, and we have now those that are white-fleshed, yellow-fleshed, red-fleshed and salmon-fleshed. We have also netted, toad-marked and smooth fruits, with green, yellow and whitish rinds. Attempts have been made to grow the winter varieties of Naples and Malta, which may be ripened from Christmas to Easter, but as yet with no encouragement. The large green melon of Naples is the best and grows in boggy land, but has thus far failed when planted in the same form of soil in Florida, under my directions.

In size the Cantaloupe varies as much as in quality, and the extremes of weight are a few ounces and fifty-two pounds, the largest being coarse-grained and somewhat fibrous in texture. Up to twenty or twenty-five pounds fine-grained fruits are produced, especially of the green-fleshed varieties. The largest imported kind was introduced from Portugal, and of native varieties, was brought recently from Colorado, both at their maximum weighing over fifty pounds, and being as large as very large Watermelons. For a combination of large size and fine quality, perhaps no imported variety ever equaled the Persian melon grown for many years in the vicinity of Washington City, under the name of the Hunter Cantaloupe, a long, golden, closely netted fruit, with green flesh, reaching twenty inches in length and a weight of twenty-five pounds. This must not be confounded with the Casaba or Smyrna melon, often erroneously called Persian, the seeds of which were sent to the United States by Dr. Goodell, now of Philadelphia, on several occasions when residing in Constantinople.

Persia is a land of melons, from which we have had, as far as known to me, but four varieties of Cantaloupe, two of which are still produced, and no Watermelon. Who now grows the Ispahan Cantaloupe of the late Bayard Taylor, or the Persian melon of our late President, Mr. Mitchell? These may still exist as hybrids; but in their original character they are unknown here. Travelers praise the melons of Persia, write about them and throw the seeds away. Missionaries and American physicians have occupied the garden-spots of the land of Ahasuerus for half a century; have sent thousands of letters home, and have often visited their own land in person, but where are the Apricots, Quinces, Melons and Pomegranates of their introduction?

My own Cantaloupe tests have been made with seeds from France, the north and south of Italy, Tripoli, Turkey, Turkistan, southern Russia, Russian Georgia, Cappadocia, Armenia, the Valley of the Euphrates, Palestine and Japan. Many melons that are excellent in France and northern Italy will not grow in our climate on account of the heat; those from the land south of Naples do fairly well, but their quality for the table is inferior. The toad-marked melons of north-eastern Italy under repeated tests have always failed, and so have our netted varieties in the cooler parts of that peninsula. Worms and bugs appear to delight in the flavor of the delicate foreign vines, and if the plants should in part escape their ravages, their leaves droop under the sun, and the fruit is not worth cutting. There is something very peculiar in the effects of soil and climate in the production of growth and flavor that we cannot understand. That seeds from cool countries should fail here, and that those from some hot countries should not, we can understand; but why varieties from other hot countries, having a good soil and cold winters, should utterly fail in quality of fruit when it, to a certain degree, grows well, we cannot explain. Of all foreign seeds, I have never seen any that grew so exactly in all respects like our own as those from the world's centre, the ancient land of Ararat, now called Armenia.

Cantaloupes may be divided into two classes: one that

ripens to the best advantage in the house, and the other on the vine and exposed to the sun. Netted and grooved melons, as a rule, attain their finest flavor in the house, and should be pulled as soon as the green color at the bottom of the grooves has fairly begun to lighten. If a netted melon is pulled a little too soon it will keep a long time but never ripen, and some varieties when apparently well matured will only go to decay if separated from the vine; such are not favorite sorts with the trucker, but may be improved by hybridization with such as ripen more readily.

Cold nights, cold, damp ground and a mild temperature, with very little or too much rain, are all antagonistic to the growth and maturing of our Cantaloupes. Cold ground, with in the day a moderately warm sun, will cause a large melon to grow flat at the bottom and very convex at the top; the flesh of the upper part will also be much thicker and better flavored than that of the bottom. This rule of flavor is a general one, and a generous way to divide a melon is to cut it through the middle of the ground spot, either crosswise or through the stem and flower ends. In seasons like that of last year, melons only become about half netted for want of sun, and are poor in flavor when considered ripe; vast quantities brought to market never ripened. The melons from my Armenian seeds were exceptional in being densely netted.

Although the pollen of a Cucumber flower is capable of ruining the flavor of a Cantaloupe, it is very rare for a hybrid to be produced. I have seen such, between a Cucumber and a Jenny Lind melon, which was a decided curiosity. A noted Palestine Cucumber, known as the Mukte's, is produced upon a vine that very closely resembles in leaf and color that of a Cantaloupe; still, the fruit is an old variety of Cucumber and quite distinct from any of our sorts. The long Banana Cantaloupe makes a curious hybrid with the Jenny Lind, the product being oval, yellow, almost free from netting, very fragrant and salmon-fleshed; it has a better flavor than the former, but is quite inferior to the latter.

In Armenia there grows a Cantaloupe, probably of large size, to judge by the seeds, which is so sensitive to the heat of the sun that the gardeners are in the habit of covering the young melons with earth until they reach a certain size, when they are uncovered; this variety will be tested the coming season in several localities. The seeds are very large and white, much larger than any we have, and resemble those of the curious yellow Cappadocia melon introduced by me several years ago and not now grown; it was long, flat, smooth and salmon-red fleshed, like the Banana Cantaloupe in all points except in its shape.

Some years ago a few winter Cantaloupes were grown in this latitude, but the measure of success did not encourage the grower to continue the experiment; still, I see no reason why other attempts should not be made. American visitors to Naples are willing to pay sixty cents for a green melon in winter, and speak of it as wonderfully fine; in fact, it is the finest Neapolitan variety, and ought to be grown in some southern state, if possible, as a new industry. If the Naples melon will not succeed, the Malta green one should be tried. These melons are put away in the fall before they begin to ripen, and kept in a cool place. When one is to be ripened it is hung up in the open air in a warm place, in a net or a little bundle of straw, as bottles are sometimes encased for packing. The Naples seeds are very large, but of a form that ought to grow; the dry soil varieties may do better in our country. —*From an Address before the Pennsylvania Horticultural Society, by Dr. Robert P. Harris.*

Orchard Experiences.—III.

THE relative value of the different methods of propagating fruit-trees is frequently discussed, but often from a too narrow and local experience. In southern Maine, for instance, nearly all the fruit-growing farmers habitually denounce root-grafted and low budded trees as worthless; and "New York trees," even from the best nurseries, are looked upon as frauds all over northern New England. It is needless to say that this is unjust; but the feeling, nevertheless, exists, is very wide spread, and has its basis on what is supposed to be a general experience.

The approved method of propagating Apple-trees in southern Maine is to grow seedlings in a nursery up to four or five years, to select the most thrifty for planting in the orchard, to set them out, and three or four years later top-work them, by grafting or budding in the limbs. This produces a tree that satisfies the requirements of that region; and the same process is in vogue in all southern New England, though low worked trees are not much objected to in Massachusetts, Connecticut or Rhode Island.

In northern New England and the eastern provinces of Canada the case is again quite different. Here experience has shown that not one Apple-seedling in a hundred, grown from seeds of fruit brought from lower New England, will survive the test winters. In these sections root-grafted or very low budded trees have exclusive preference, upon quite as solid grounds of experience as top worked trees in southern Maine. If top working is ever successful in the "cold north," it must be a double working—the stocks being first root grafted or low budded to some "iron-clad" variety and then reworked in the branches after they have been established in the orchard.

It may appear strange that such diverse views should prevail over what may seem not a very wide extent of country. This extent is greater, however, than many suppose—the extreme distance between the St. Lawrence River and Long Island Sound covering between seven and eight degrees of latitude, with a difference in winter climate as great as that between New Jersey and South Carolina.

In the Apple-growing region of Maine, extending but little more than fifty miles back from the sea-coast, Apple-seed-

and the ill repute of "New York trees" is due, not to the way in which they are worked, but to the tenderness of the varieties offered. Root grafted or low budded Oldenburghs, Wealthys, etc., succeed well; and were it not for the misrepresentations or the ignorance of those nurserymen who are sending out such insufficiently hardy kinds as Mann, Pewaukee or Wolf River, root grafted trees of the "iron clad" varieties would find a large market there. In fact, considerable quantities of New York grown Oldenburghs, Tetofskys, Wealthys, Scott's Winters and Yellow Transparents are now sold there, although the dealers, well aware of the old and strong prejudice, declare them to be home grown.

As all this ignorance, and consequent prejudice, is injurious, alike to the growers and planters of trees, it well behooves all those of the former class to inform themselves thoroughly about the hardiness of every variety they grow. As their location deprives them of practical experience on the subject, they ought to study the reports of the local horticultural and pomological societies. There is a rich mine of knowledge to be found in the reports of Iowa, Minnesota, Wisconsin, Onta-



Fig. 28.—The Cypress of Montezuma.—See page 150.

lings from home grown seed are usually hardy enough to be used in the orchard for top-working successfully such varieties as the Baldwin, Rhode Island Greening, Northern Spy and Roxbury Russet, which are the leading commercial Apples of that section. Not one of these Apples, nor of such fall varieties as Gravenstein and Porter, are hardy enough, except quite near the coast of western Maine, to endure the climate when worked low. So grown, the young trees suffer in the trunk from the hard winters, and become unsound and unprofitable in a very few years. This explains why "New York trees" have so bad a name there; and the same is the case with the strip of country of about equal width, extending west from Maine to Lake Champlain.

South of this belt, in southern New Hampshire and Vermont and in the three lower states, low worked trees are again available. The only other section where the conditions of southern Maine are encountered is in the upper Champlain Valley. Here, again, the great commercial Apples named must be top worked to be enduring; but elsewhere in northern New England and in the provinces a climate is reached in which not even top-worked Baldwins, Greenings, etc., can endure the winters. Here an entirely different class of Apples is called for,

rio, Quebec and Maine; and every commercial orchardist in those sections, as well as every nurseryman desirous to supply the "cold north" with trees of a quality that will enable them to hold their trade, has need of it. It is quite as necessary to know what will not, as what will answer to plant in every county where a sale is sought. There are no better trees than those grown in the New York nurseries, but a sort of supercilious attitude in a few of them stands in direct antagonism to their own interests as well as to those of their patrons.

Newport, Vt.

T. H. Hoskins.

Notes on Hardy Ferns.

Asplenium Filix-femina is one of our most common northern Ferns, and one of the easiest to transplant. It varies much according to the location. In rich soil, along the margins of swamps, it is frequently over three feet high, with fronds nearly a foot wide; while in other localities, and in poor soil, it is often only eight or ten inches high, with fronds proportionately narrow. These forms are all very beautiful, and seem to thrive in moist soil in either sun or shade. The variety *angustum* of this species has narrow, erect fronds, though often two feet

high. It is quite distinct in outline from the common type and much rarer.

Another Spleenwort, a more local plant, is *A. angustifolium*, although, in its chosen home, it is usually abundant enough. It seems to select moist, half shaded ravines. The fronds, unlike most of our hardy Ferns, are only once divided. Those which bear the fruit are narrower and generally taller. In the tallest specimens the fronds are about three feet long, of a light green color, and generally three inches wide. It thrives in moist, loamy soil, and prefers some shade. Like most hardy Ferns, it needs time to become established; and plants are generally stronger and finer the second year after setting.

Asplenium ebeneum is a much smaller species than either of those above mentioned. It is seldom more than a foot high, with fronds an inch wide, once divided, and with a black and shiny stem. The fronds are evergreen. It is found on broken, rocky terraces, in the sun or half shaded situations, in crevices of broken rocks. It is, therefore, a rather local plant, though not rare. We have always found it hardy enough, and it surely thrives naturally in exposed situations. It should be valuable in many parts of the rockery on account of its size and shape. Usually, in the larger specimens, the fertile fronds stand erect, with a tuft of smaller sterile ones prostrate about the roots.

Of the Shield Fern (*Aspidium*) we have in New England about fourteen species and varieties. One of the most common and valuable for ornamental purposes is *A. acrostichoides*. This species, which bears a once divided dark evergreen frond, is inclined to grow in clumps, and fine plants can be grown in either sun or shade. The variety *incisum* is not common, nor do we believe perfectly fixed in character. It is not rare to find plants with some fronds deeply incised, while others are almost or quite free from this. The fronds of this species are thick and durable, usually appearing nearly as fresh in early spring as in autumn.

The Climbing Fern (*Lygodium palmatum*), when once established, is one of the most charming species we have. It seems to transplant best in the spring. Naturally, it grows among low shrubbery, seldom or ever in the open sun, but twining over low bushes, which shade its roots. A moist, loamy soil is needed, with a low trellis to support the slender, twining stalks.

Southwick, Mass.

F. N. Horsford.

Anthuriums.

THIS highly ornamental genus of tropical plants may be divided into two classes, (1) those varieties characterized by their handsome foliage and (2) those in which the flowers form the most noticeable feature. The members of the latter division have been comparatively few in number, at least in original types, the larger part of the fine-flowered Anthuriums having been of garden origin. The most widely known of the original species is *A. Scherzerianum*, the oblong-lanceolate leaves and bright scarlet spathes of which are familiar to all gardeners. This plant has greatly improved under cultivation, and has produced a number of varieties, as the seedlings vary greatly both in form and size of flowers and foliage. Among the most notable of these are *A. Wardii*, a very large and strong-growing form, both foliage and spathes being particularly broad, and the latter very brilliant in color; *A. Cypheri*, the spathes of which are inclined to crimson in shade; and *A. Rothschildianum*, the last named having bright scarlet spathes, which are usually dotted or marked with white, and it is especially recommended by some growers for its free-flowering qualities.

Anthurium Andreanum is another species in the flowering section, now becoming widely distributed, as it seeds profusely and the seeds germinate readily in a warm house and moist atmosphere. This, like *A. Scherzerianum*, is quite variable when raised from seeds, and some forms thus produced will be found of little value, while others from the same sowing may prove of special merit. *A. Andreanum* is of stronger growth than *A. Scherzerianum*, and in some cases it assumes an almost scandent habit, in which, however, it should not be encouraged, as the flowers are apt to depreciate in quality when the stem of the plant becomes long and straggling.

A. Ferrierense is very much like the last named species in growth and habit, the chief distinction being in the color of the spathe, which is a deep, rosy pink. This variety is not so much of an acquisition as *A. Andreanum*, and has not become a general favorite.

In the other section of the Anthuriums are to be found some with leaves so large and beautifully marked that they are among the choicest ornaments of the tropical house.

Prominent in this class is *A. crystallinum*, an extremely handsome plant from tropical America, with very large cordate leaves, the veins of which are marked out by bands of white which remind one of frosted silver.

Somewhat similar in general appearance is *A. magnificum*, a noble species with leaves from two to three feet in length and broad in proportion. The ground color of the leaves is dark olive-green, which offers an admirable contrast for the white veins, and makes this plant one of the most effective for exhibition in a collection of foliage plants. *A. Warocqueanum* is a species of more recent introduction than the preceding, and is well worthy of a place in any good collection. This plant has large cordate-acuminate leaves of bright green, with prominent veins of a lighter shade.

Another handsome plant from South America is *A. regale*, the leaves of which are a rather dull green in color, with white veins, and stand up well on long foot-stalks. *A. regale* is also a strong grower, and if properly treated will produce its large and striking foliage quite rapidly.

As regards soil, all of the Anthuriums require a light, rough compost, a good mixture being equal parts of fibrous peat and chopped sphagnum, with a liberal addition of clean, sharp sand, and some broken charcoal. The drainage of the pots or pans should also be properly attended to by filling them with crocks or other suitable material, for while they enjoy copious waterings during active growth, the Anthuriums are liable to suffer if the soil should become sodden and sour, and the thick, fleshy roots soon rot. They need a warm temperature, sixty-five to seventy degrees at night being most suitable for the species with ornamental foliage, though *A. Scherzerianum* may be grown in a lower temperature successfully. Shading will be found necessary during the summer months, and a moist atmosphere at all times, and in the case of those grown especially for their foliage it is best to remove the flowers as they appear, not only on account of their insignificant appearance, but also to prevent their weakening the plant. Seeds may be sown in a mixture similar to that recommended for potting, and if placed on brick bottom-heat and kept moist, it will germinate in a few weeks. They are best sown as soon as ripe.

Holmesburg, Pa.

W. H. Taplin.

The Spring Garden.

TWO snow-falls within the last fortnight protected low growing plants through a few days of low temperature, and flowers which were in bloom at the time passed uninjured through what to most people seems a severe trial. Really, however, a blanket of snow is the best possible protection from cold winds and biting frosts, and melting snows seem to stimulate the growth of early growing plants. Is this because of the ammonia contained in snow-water? Many of these plants are alpine, and in their natural stations they flourish close to the edges of the snow-banks as they retreat before the warm, bright sun. Of course any stimulus in the snow water is a minor element compared with the effect of the increasing heat of the sun, the manifestation of which in the annual renewal of growth in the spring is one of the most imposing displays of natural forces. With the increasing light and warmth almost all of the early blooming plants are boldly blooming or rapidly preparing to do so. I noticed this morning that one little Squill, which for weeks had peeped at the level of the ground apparently watching its opportunity, had at last suddenly thrown its bright flowers gaily to their full height. Not so bright, but earlier to bloom than any of the Scillas, is a little Grape Hyacinth from Mount Taurus. This is especially good for the rockery, as the plant is rather diminutive and its color (blue) rather dark in tone for effect on the level. It sends forth its long, narrow foliage in the fall and has been one of the earliest flowers to show color, and yet it opened very slowly. While it has not been injured in any way by frost it seems rather discouraged in bad weather. The flowering scape is only some three inches high.

More cheerful are the Primroses, on which straggling blooms have appeared all winter, though the hybrid varieties, such as we usually grow in the garden, do not pass unscathed either in flower or foliage during severe weather. However, we seldom have bloom until April, and while the foliage may be scorched by frost new leaves are quickly put forth. The plants are perfectly hardy and most accommodating subjects, as they bear shifting without injury, and, provided the clumps are not broken up just before blooming-time, will always give a good crop of flowers. In heavy soil Primroses grow vigorously and I prefer to leave them without protection, as wet is a greater enemy than severe weather. Primulas in bloom are surely among the most pleasing flowers and indispensable in spring

gardening. A stock is easily prepared, as seeds of a good strain (Dean's is as good as any) if sown in April or May will make strong plants before winter, and will bloom the next spring. After blooming they may be separated into single crowns and planted in odd spaces to make growth for another season. Flowers of a good strain, in color white, yellow and many intermediate shades, are an inch or more in diameter, larger than *Polyanthus* (*P. elatior*) and preferable in many respects. In fact, the average cultivator will find the modern hybrid hardy *Primulas* quite sufficient for his wants in this family, for while there are some fine "species" a large number are of interest principally to the specialist. Where protection of a frame can be had *P. cortusoides* will be found satisfactory, as it has been much improved in recent years by careful selection. This is a deciduous species, and it is now starting into new growth, the foliage having disappeared in the fall. A frame suitable for alpine *Auriculas* seems to suit it.

Elizabeth, N. J.

J. N. Gerard.

Orchid Notes.

Cymbidium eburneum.—Many plants of this desirable Orchid are now in full flower with us, filling the house with their delightful perfume. Even when out of bloom this Orchid, with its finely arching, dark green grassy foliage, is highly ornamental, and the wonder is that it is not more commonly grown. The scapes, which are erect and clothed with large green bracts, bear one or two flowers about five inches across; these are ivory white, of good substance, with a large blotch of orange-yellow on the front of the lip, and numerous spots of crimson on the under surface of the column. *C. eburneum* grows freely in an intermediate temperature if abundance of air can be given. At no time should the plants be allowed to become dry. When not overpotted scarcely too much water can be given. The pots should be well drained, and the soil should consist of two parts of rich fibrous loam to one of well rotted manure, with plenty of sand to keep it open. The thick fleshy roots are great feeders, and as soon as they fill the pots liquid manure should be given two or three times a week. There are two or three named varieties of this species, but none of them are particularly distinct. It was introduced from the East Indies in 1846.

Chysis Chelsonii.—This magnificent hybrid is the result of crossing *C. bractescens* with *C. aurea*, but it is far superior to either of its parents and in every way more vigorous. On strong plants the bulbs are more than eighteen inches long and three inches in diameter at thickest part. The upper portion of the bulbs is clothed with the bases of the long lanceolate leaves. The racemes which appear with the young growth are about one foot long and bear about a dozen handsome flowers of fleshy texture and about three inches across. These are of a nankeen color, with the apex of the segments orange-red. The lip is prettily streaked with red, and the flower lasts a long time. *C. Chelsonii* should be grown in the warmest house, potted in a compost of sandy peat and loam, with a liberal addition of chopped moss and rotten leaves. Abundance of water should be given after the new growth is well rooted with occasional doses of liquid manure. After the growth is fully matured water should be to a considerable extent withheld, and the plant removed to a drier atmosphere.

Lycaste gigantea, as its name implies, is of unusually large growth. The stout, conical bulbs are about six inches high, and surmounted by two or three thin, lanceolate leaves more than two feet long. The scapes, usually five or six in number, appear from the base of the bulb, and with the new growth. They are erect, nearly eighteen inches long and bear a single flower more than eight inches in diameter; the lanceolate acute petals and sepals are yellowish green. The lip is fleshy, purplish brown, beautifully margined and fringed with orange. The large, pure white column is densely clothed with short hairs on the under surface. *L. gigantea* succeeds admirably in a mixture of peat and moss, with a liberal addition of chopped, half rotten leaves. It requires an abundance of water during growth and should at no time be kept dry. It does best with us in the intermediate house—that is, in a temperature of fifty-five to sixty degrees during the winter months, and as cool as possible in summer, with abundance of air. This species was introduced from Central America in 1843, but is not often noted in collections.

Lycaste cruenta, now flowering freely, is of quite a different type from the foregoing. It is deciduous, losing its leaves in early winter, and consequently it should be kept fairly dry in a cool house until the new growths appear. The numerous scapes are about six inches long, bearing a single flower about three inches in diameter. The sepals are greenish yellow, the petals and lip deep orange, excepting a large blotch of crimson

at the base of the latter and a few spots of the same color on the base of the former. This is a very free blooming plant, and the flowers—which are fragrant—last quite a long time in perfection and are very useful for cutting. It requires very liberal treatment during growth, but care should be taken not to overpot it.

Kenwood, N. Y.

F. Goldring.

Iris Susiana.—Of the numerous species of *Iris* now in cultivation, none are more beautiful than this. Exquisitely delicate is the penciling of the petals, the inner three of which, usually known as standards, are of such a size as to place this species among the largest of the genus, a well developed flower measuring seven inches across. The three outer and lower petals, or falls, are partly clothed with a dense beard, and have a dark brown blotch in the centre of each. This plant is by no means a new one, having been among those cultivated by Gerard and figured in his *Herbal* three centuries ago. *Iris Susiana* is a native of Mesopotamia and Syria, and it is unfortunately too seldom met with in flower under cultivation. This is probably because its peculiar habits and requirements are not sufficiently understood. *I. Iberica* much resembles *I. Susiana* in this respect, and both belong to a division of the sub-genus *Euiris*, known as *Oncocyclus*, so that their botanical and cultural affinity is well marked, and we find them both to succeed well under the same treatment. These *Irises* are usually imported in autumn in a dried state, together with other flower-roots, and when received they should be potted up in a sandy compost and placed in a cool house or frame, where they will commence to grow at once, and continue to do so through the winter until their flowering season, which is in early spring. They rarely flower, however, the first year. When the weather will permit the plants may be transferred to a well drained soil in the border. In June the leaves die down, and the plants rest until September. During this period of rest English growers place a hand-light over the plants to ripen them by artificial drought. This is not necessary here, owing to the greater amount of sun-heat to which they are naturally subjected. In September growth begins and continues throughout the winter if the plants be lifted in fall, potted and placed in a cool house; and then flowers may be expected in March. It must not be inferred from this that these *Irises* are not hardy, for we have flowered them in the open ground and expect to do so again. But when their beauty and the simplicity of their culture is considered, it is not too much to ask for them pot-room in a cool house, where they will present a welcome relief to the monotony of *Calceolarias* and *Cinerarias* in the spring months.

Passaic, N. J.

E. O. Orpet.

The Forest.

The Hemlock.

WITH the exception of the White Pine, the Hemlock must be regarded as the most valuable of all the trees of the United States east of the Mississippi River, so far as abundance of timber products up to the present time is concerned.

The wood, for many purposes, especially in the unexposed parts of structures, has no superior, if, indeed, it have any equal. Its capacity for holding nails is greater than that of the White Pine, while its durability is equally great in corresponding exposures. With these qualities in its favor, the Hemlock must be regarded as worthy of careful consideration with reference to its bearing upon the important forestal problems of the nation. In the brief paper I have prepared for the present occasion, I have drawn my matter largely from a report upon the Hemlock, prepared by me for the Forestry Division of the Department of Agriculture, based upon a somewhat extended study of its biology, history and economy.

The wide range of the Hemlock, covering, in its natural distribution, more than one-half million square miles, extending through thirty degrees of longitude and thirteen of latitude, would of itself suggest its adaptation to forestal purposes. The impression received from its distribution is further strengthened in the fact that the tree grows naturally in a considerable diversity of soil, climate and situation. Few trees of our native forest are more marked in this respect, and somewhere within its range it is found as an associate of nearly every species of the arboreal flora of eastern North America north of Alabama. If, however, we examine the question from the stand-point of actual experience in the cultivation of the Hemlock, the matter appears far less encouraging.

I.—The demands which the Hemlock makes in regard to soil and climate are of so general a nature that no obstacle to its cultivation can arise from this consideration, although, like other plants, it manifests a certain preference for particular

situations. Throughout the area covered by its natural distribution there are millions of acres adapted to the highest development of the Hemlock, which are unfit for any other than forestal purposes. No requirements exist, therefore, in regard to soil and climate, which are not amply supplied.

II.—The tendency of the Hemlock to renew itself naturally on areas which have been largely or completely deforested, is less marked than that of most other tree species. Still, the tendency to natural renewal is by no means wanting. The writer has seen a large pasture adjacent to a piece of Hemlock woods well stocked with a growth of young Hemlocks. They bore evidence of having been disturbed by cattle, but there were abundant indications that if left to themselves they would completely reforest the area on which they were growing. Other similar instances have been mentioned by correspondents in numerous locations. The Hemlock is an abundant bearer when once it has reached the fruiting age, although the seed-crops are biennial. The chances for a wide dispersal are enhanced by the structure and hygroscopic quality of the cone. The seeds are shed at different periods, extending from autumn until spring. Fertile seeds have been found in the cones as late as the last of April. The seeds, if favorably placed, germinate freely; the specially favoring conditions being a moderate amount of shade and moisture. The latitude, in this respect, is not great, as any considerable excess of moisture causes the young plants to damp off, while from any great lack of it they wither and perish. While the young plants must be regarded as exceedingly delicate, they are, nevertheless, capable of enduring a considerable range of climatic and other conditions. There seems to be no inherent reason in the nature and constitution of the Hemlock to operate against its natural renewal on areas from which it has been removed, provided the conditions are favorable to that end. The essential conditions are twofold: First, the rigid exclusion of all domestic animals; second, obviously and chiefly, the prevention of forest fires. While these conditions apply to all tree species in common with the Hemlock, they are relatively of greater importance in regard to the latter on account of its constitutional delicacy. A third condition would be the removal of a certain proportion of the seedlings of other species which are endowed with a greater degree of vigor.

III.—In regard to the cultivation of Hemlock in nursery rows for subsequent transplanting, practical experience shows its want of adaptation to this purpose. In its seedling state it is probable that no other tree species is of so slow growth; at the end of its first year a seedling is rarely more than an inch in height; and at the end of its third or fourth year it has increased to scarcely more than three or four inches. This low growth is characteristic of the Hemlock during many subsequent years, although at a later period the relative rapidity of growth is somewhat increased. While these facts materially lessen the adaptability of the Hemlock to forestal purposes, they do not prevent the employment of the Hemlock in the renewal of forests in the method previously considered. Moreover, it should be stated that while the rate of growth here indicated is based upon my own experience and observation, and is confirmed by many correspondents who have had large experience in the cultivation of the Hemlock, there are a few correspondents who consider it to be, in specially favored situations, as rapid a grower as most other conifers.

IV.—A few facts concerning the consumption of the products of the Hemlock may be here noted. What are regarded as trustworthy estimates, place the amount of bark used for tanning purposes in 1887 at 1,200,000 tons, which, at eight dollars per ton, would represent a value of \$9,600,000. Estimating the amount of manufactured lumber at 1,500 feet per ton of bark, would give 1,800,000,000 feet as the total amount, representing a value, at twelve dollars per 1,000 feet, of \$21,600,000. While a considerable portion of the peeled timber is wasted, and should be deducted from the above estimates, it is believed this amount is made good by the use of unpeeled timber for railway ties, fuel and various other purposes. It may, therefore, be estimated that the full value of the products of the Hemlock is, in round numbers, \$30,000,000 per annum. The length of time during which our remaining Hemlock forests will continue with this annual

drain upon them is, of course, uncertain; but the most careful and conservative observers consider that the present supply could not be maintained for a period exceeding twenty or twenty-five years. It becomes, therefore, a question of great practical importance as to the way in which the existing demands upon the Hemlock shall be hereafter supplied. These supplies can, of course, be afforded in only two ways: First, by the substitution of corresponding products from other trees or other sources; Second, by the renewal of the Hemlock forests.

The general conclusions which have been arrived at as the result of a somewhat careful investigation of the present subject may be briefly summed up as follows: The Hemlock has been, from the earliest settlement of the country, a tree of vast economic importance to the people of the eastern and northern states; that in this respect it has been second to none of our native forest trees, with a possible exception of the White Pine; that the tree has been exhausted from vast areas where it formerly existed in great abundance; that at the present rate of consumption the entire supply will be practically exhausted in from twenty to thirty years; that nothing has been anywhere done toward reforesting the areas from which it has been removed, and that its nature and constitution afford only a moderate promise of its adaptation to economic forestal purposes. Finally, it may be stated that the most prominent result of the investigation to which I have referred has been to give great emphasis to the fact, not as yet sufficiently recognized, that the country ought to give prompt and energetic attention to the whole subject of forestry, that no successful forestal management is possible in the absence of adequate knowledge of the subject, and that this knowledge is attainable only through intelligent experiment, experience and study.—Read before the American Forestry Association by Professor A. N. Prentiss.

Correspondence.

Hollyhock Diseases.

To the Editor of GARDEN AND FOREST:

Sir.—So much has been said about the true Hollyhock disease (*Puccinia malvacearum*, Mont.) that it is only fair to call attention to another one. Last year, in and around New Brunswick, New Jersey, it was almost impossible to find a single healthy Hollyhock among the thousands of plants. At first the lower leaves began to exhibit large circular brown patches, sometimes bounded upon the side toward the centre of the leaf by the veins, thus giving an angular outline. Soon after the largest leaves of all suffered and fell, and by the middle of August whole rows of the plants exhibited leafless stems. Few gardeners now have any plants, but one enterprising propagator has a long row of fair-sized seedlings in pots. When I first saw these seedlings they were—a few hundred of them—in a box under sash, and so badly infected with the blight that there seemed at first to be no hope for them. Perhaps one plant in five was saved and pricked out in a fresh box; and the following remedy was applied almost daily: Three ounces of carbonate of copper were dissolved in a quart of standard ammonia, and afterward diluted to twenty-two gallons with water. At the same time the older leaves which developed the spots were removed and burned, until a comparatively healthy condition has been reached. The disease is due to a *Cercospora* and probably *C. althaina*, Sacc., a species which in its various forms grows upon the common Mallow (*Malva rotundifolia*), Velvet-leaf (*Abutilon Avicennæ*) and a species of Callirhoe.

As said in the beginning, too much credit should not be given to the Hollyhock rust (*P. malvacearum*) that has come to us from abroad while we have a blight of our own to attend to, even if it is one that can be kept in check perhaps if taken in time by using a compound of copper.

Rutgers College.

Byron D. Halsted.

Grafting.

To the Editor of GARDEN AND FOREST:

Sir.—I do not think Mr. Parsons goes quite to the bottom of this question of grafting (see p. 44). My view of the question is that if any conifer will not grow in America or in Europe without grafting, it is not worth cultivation at all. Grafting for timber-trees will never pay. The plain fact is that own-rooted fruit-trees have never, or very, very rarely, been tried side by side with the grafted ones, and until this is done no one really can know that grafting is the best, or even one of the best ways. One would have thought that our horticultural societies, or those botanists who profess to know something of vegetable

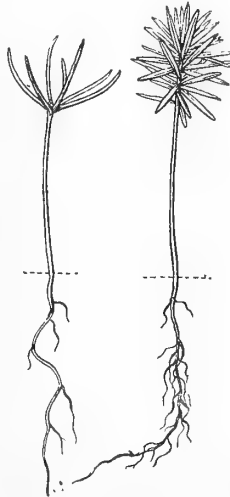


Fig. 29. — Seedling Hemlocks, one and three years old, natural size.

physiology, would have settled this simple question of grafting, or of stocks versus own roots, long ago. But not a bit of it; in point of fact, the scientific people do not know as much as the practical gardener in this matter, and even the gardener is too often led by custom, or he does what is usual, rather than undertake original research for himself. Knight long ago formulated the axiom that the best form of vegetative restriction or pruning to which a fruit-tree could be subjected was a heavy crop of fruit.

It has been well said that every red deer shot in Britain costs at least fifty pounds, every pheasant at least a guinea; and in many private gardens the peaches are not grown for less than five shillings apiece! I lately saw some Peach-trees as grafted on Plum stocks. They are half-standards in a vinery and the Peach scion is vainly protesting against starvation by trying to root out all around the swollen point of the so-called "union" between scion and stock! The Peach-tree on its own roots grows as freely as a Willow, and if any restriction is wanted we have half a dozen ways at least, each and all more efficient than grafting.

Grafting has become a sort of fetish with many propagators. Nature at her best is ahead of even the most successful gardener, and she does not graft her productions. The Grapes of Alicante or Cashmere are not grafted, and I have yet to learn that they have been surpassed in our gardens. So also the Peaches of Persia and the Apricots of Thibet, of which travelers rave when eating the finest grafted produce of the west. That finest in flavor of all Pears, the American Seckel, was a chance seedling and not grafted, and I have never heard of a grafted tree that could surpass the original one as discovered by "Dutch Jacob" near the Delaware. The original tree of the Ribston Pippin Apple was an ungrafted seedling, and a root-sucker from it is alive to-day, but I do not know of any grafted fruit-tree in Britain a century old, and for every thousand of grafted conifers alive, and very often stunted and unhappy, in Britain to-day, there is reliable evidence to prove that at least ten times that number have proved to be disappointing failures.

Botanical Gardens, Trinity College, Dublin.

F. W. Burbidge.

Grafting Oaks.

To the Editor of GARDEN AND FOREST:

Sir.—It has always been thought that the grafting of American Oaks on stock of European species, a difficult operation to perform in some respects, could not make long-lived trees and that this was especially true of *Quercus coccinea* and *Q. rubra*. Moreover, as the acorns of several varieties have been imported in quantity during the past century, it was easy and natural to secure them, and therefore but little grafting was done. I have noted a remarkable exception to this, however, near Potsdam, the Prussian Versailles. The marble palace stands on the borders of a lake in which are mirrored masses of foliage from the surrounding trees in a beautiful park still called "The New Garden," although it is now a hundred years old. Laid out at a time when the interest in American trees, then newly introduced, was at its height, this royal garden is rich in foreign varieties of forest trees, which are now in fine condition, as perhaps will be remembered by you and Mr. C. A. Dana, with whom it was my good fortune to visit this spot. Near the library, standing apart from other trees, there is to be found a remarkably fine specimen of *Q. rubra*, grafted upon our *Q. Robur*, for which our name is Steineiche. This interesting tree is thirty-three feet in height, with a circumference of six feet seven inches. The graft was made at the height of thirteen feet, and what makes the appearance of the tree peculiar in winter is the fact not only that the bark of the top is much smoother than that of the trunk below, but because the top is entirely leafless, while at the same time the branches which have been put forth below the graft still hold their leaves, though browned and shriveled by the winter.

M. Reuter, head gardener at Peacock Island, first called my attention to this tree. The establishment of this park at Potsdam dates back just a century, that is, from the commencement of the short and brilliant reign of Frederic William II., the successor of the great Frederic. If, as is reasonable to suppose, this tree was among the earliest planted, its age must be estimated at from 90 to 100 years. In this case the durability of the graft could not be better demonstrated.

Berlin.

C. Bolle.

The Study of Botany.

To the Editor of GARDEN AND FOREST:

Sir.—I am glad you advocate the study of botany for the young, as it gives them an interest in natural objects which may be a source of pleasure to them through life.

Perhaps my experience with my own little girl may interest you. Three years ago, when she was nine, I made up a class of children of about her age, and engaged a botanist to give them lessons twice a week during the summer. These lessons were much enjoyed by the children, who always looked forward to them with pleasure. The interest which they took in flowers was greatly increased, and this added much to the pleasure of their walks. Their powers of observation and discrimination were increased, and the technical names did not seem to present any difficulties.

We spent last summer in Switzerland, where the vegetation was a constant source of pleasure to the children, so that the journeys, which are apt to be tiresome to young persons, were made delightful to them, by their finding and collecting flowers.

This winter, of their own accord, they have taken up the study of mineralogy, which interests them as much as botany.

It seems to me that the study of the natural sciences is better fitted for the education of young children than most of the branches taught in schools. One great advantage they certainly have; the children become fond of study and investigation, their education becomes a pleasure, and their faculties are more evenly developed than by those studies which exercise little besides the memory.

Highland Falls, N. Y.

P.

Orchids at Easton, Pennsylvania.

To the Editor of GARDEN AND FOREST:

Sir.—Early last month I paid a visit to the greenhouses of J. Eyerman, Esq., College Hill, Easton, Pennsylvania, where almost always there may be seen a number of choice Orchids in bloom. Phalænopses in five varieties were finely in flower, including a beautiful dark rose colored and well shaped *P. Sanderiana*, but noticeable above all was a magnificent and substantial variety of *P. grandiflora*—the old Java form. The spike carried six enormous and very compact blooms, measuring more than four inches from petal to petal and three and three-fourths inches in depth. This may be considered a gem amongst Phalænopses.

The genus *Cypripedium* finds special favor in the eyes of Mr. Eyerman, and there may be seen in flower and bud the following kinds: *C. Boxalli*, *C. villosum*, *C. Harrisianum*, *C. nitens*, *C. Lowii*, a fine variety of *C. plumerum*, several specimens of *C. Argus*, including one extra-broad petaled and highly colored form; *C. hirsutissimum*, *C. cardinale*, *C. callosum*, *C. bellatulum*, *C. Parishii*, *C. grande*, *C. Dayanum*, *C. Danthieri*, *C. chloroneurum*, *C. caudatum*, *C. Crossianum* and numerous plants of *C. Lawrenceanum*.

Cattleyas and Dendrobiums, in great variety, were in bloom with *Lycaste Skinneri*, including a fine plant of the always rare and lovely variety, Alba, bearing six flowers, a grand specimen of *Cymbidium Lowianum*, several of *Cymbidium eburneum*, and the attractive *Lælia harpophylla*. Odontoglossums and Oncidiums of many kinds were flowering well, and last, but not least, I noted a handsome plant of the deliciously fragrant little Orchid, *Dendrochilum glumaceum*, with some seventy spikes of flowers.

New York.

E. V. L.

Notes.

The international botanico-geographical exhibition which was to have been held at Antwerp during the coming summer has been postponed until 1891.

Thirty-three pages of the last number of the *Kew Bulletin*, in double columns, are taken up with a list of hardy herbaceous plants, shrubs and trees, the seeds of which may be had by way of exchange from the Royal Gardens at Kew.

In an article on "The History of Garden Vegetables," published by Dr. E. L. Sturtevant in the *American Naturalist*, he includes the Nightshade (*Solanum nigrum*), saying that "in the Mississippi Valley the little black berries are made into pies and other pastry."

The last report of the Park and Garden Department of the city government of Berlin shows that during the past year \$84,473 had been expended upon the nurseries and forest-plantations where material is grown for use in the streets and parks of the town.

Mr. A. L. Kean, writing in the *Botanical Gazette*, states that, from experiments made by himself, he believes the disease which since 1885 has seriously affected the Lily plantations of Bermuda is due to the same species of Botrytis which has afflicted *Lilium candidum* in England.

At a recent meeting of the Royal Horticultural Society in London a plant of *Masdevallia Tovarensis* was exhibited which bore 255 leaves and 162 flower-spikes with 346 open blossoms. When the exhibitor, Mr. Hodgson, bought the plant fifteen years ago it bore only two small leaves.

It appears from a London letter in *The Sun* that Madagascar has gone into the lumber business. The first cargo from that country reached England a fortnight ago, and the wood made a favorable impression on experts. It consisted entirely of hard woods, which resembled mahogany, walnut and teak, and commanded good prices.

Phalenopsis Cynthia × is recently described as a new natural hybrid affined to *P. leucorrhoda*, also supposed to be a natural hybrid. The only difference between the two is that the tendril-like appendages to the labellum are only about half as long in the former as in the latter, and in *P. Cynthia* there is a slight tinge of yellow on the front lobe of the lip.

The fruit-growers of southern California have found that a crop of Peanuts can be raised between the trees of a young orchard with no loss to the trees if the vines are left to decompose in the soil. The Peanuts net from five to eight cents a pound, which means from \$125 to \$200 an acre. This makes a good revenue from the land until the fruit-trees come into bearing.

The Sugar-cane disease which started three or four years ago in plantations near Cheribon, Java, is said to be spreading with alarming rapidity. At a recent congress of planters and others interested in the production of sugar, a fund of \$90,000 was subscribed to engage a bacteriologist to come from Europe, investigate the cause of this disease, and if possible devise a remedy.

A San Diego paper announces that an "herb garden" of some ten acres in extent is to be established near that city by Mr. Augustus Lang. Plants particularly valuable for their medicinal qualities, and, perhaps, flowers especially desirable for their perfume, are to be cultivated. A laboratory is to be erected for the treatment of the herbs and flowers grown, so that essential oils and extracts, as well as dried herbs, will be prepared for the drug market.

It is computed that 100,000 trees have been planted in the streets of Paris, exclusive of those which adorn the larger squares and parks. The kinds chiefly used are the Ailanthus, the Norway and the Sycamore Maple, the Horse-chestnut, the Elm, the Locust, the Occidental Plane (Buttonwood), the Silver Linden and the Paulownia. Such care is taken to provide a sufficiency of good soil that the cost of setting out a single tree reaches \$61, and \$50,000 are annually expended for the purpose.

Mr. S. E. Jelliffe has caused to be reprinted in separate shape the catalogue of the plants growing in Prospect Park, Brooklyn, which he originally published in the *Brooklyn Daily Eagle Almanac*. It includes, of course, many foreign as well as native plants, and the list embraces 286 flowering plants and sixty-two cryptogams. Among the latter one would, perhaps, have expected to find more than nine species of Ferns. It will be a pity if this list is not placed on sale somewhere in the park, and the example set by its author might advantageously be imitated by students in this and other cities.

Some analyses of apples, made at different periods of their growth, under direction of Mr. J. W. Clark, horticulturist of the Missouri Experiment Station, shows that much the greater proportion of the ash, or material drawn from the soil, is stored up in the early part of the growth of the fruit. This gives an additional reason for thinning early, or as soon as wormy or imperfect specimens can be distinguished. It shows, also, that a barrel of large and perfect apples takes a smaller amount of mineral plant-food from the soil than a barrel of small, inferior fruit. The analysis shows that the apples on an acre of ground, where the trees stand thirty feet apart, and yield ten bushels of fruit to the tree, take from the soil more than seven pounds of phosphoric acid and forty-three pounds of potash. This justifies the use of bone-dust and ashes, or one of the potash salts, as a dressing for orchards.

Writing in the March *Bulletin of the Torrey Botanical Club* with regard to a collection of Sedges sent him from Phoenix, Keweenaw County, Michigan (a spot on the western side of a small peninsula which juts into Lake Superior from the southward), Professor L. H. Bailey says that in all regions adjacent to the Great Lakes the flora is anomalous. "It presents a curious mixture of northern and southern types, yet the northern types are not particularly marked." There is "a tendency of the southern types to creep northward along the Great

Lakes, particularly on the shores opposite the direction of the prevailing winds. These winds, traversing the warmer area of the water, maintain the winter temperature on the shores upon which they blow at a higher point than it reaches on the opposite side. Thus it appears to be true that the flora of the eastern shore of Lake Michigan has in it more plants of a southern type than the western shore; at any rate, it is true that the western shore of the state of Michigan presents in its flora a warmer cast than does the eastern shore of the state." The most interesting entry in the list of sixty-four Carices is *C. exilis*, for which the most western locality hitherto known has been Wayne County, western New York, and which, even in the east, is a rare species.

A picture of the Washington Memorial Arch as it is to be built in marble, which was recently given in the *Sun*, shows many changes from the much admired wooden prototype. The piers are much more massive and the span of the arch relatively smaller, while the distribution of the ornamental motives is also quite different. Of course, the proportions suitable for a wooden construction could not have been exactly adhered to, and we may trust its designer to believe that greater beauty will spring from his modifications as well as greater stability. It was first proposed to place the arch in a line with the external boundary of Washington Square, but it has been decided to set it back half way between this point and the open central space. In this way the large trees near the street will not need to be removed, and, moreover, a dignified approach to the arch can be made by forming an open space in front of it with, it is suggested, a pair of isolated ornamental shafts bearing appropriate emblems. Some such treatment is certainly desirable if there is to be true harmony between the stately memorial and its surroundings. The sum raised for building it now amounts to \$75,000, but \$150,000 ought to be raised if the architectural beauty of the work is to be properly enhanced by sculptured decoration.

A correspondent of *The Garden*, London, gives some interesting notes on synonyms among Chrysanthemums. For instance, in 1886 Messrs. Cannell exhibited several new varieties imported direct from Japan, and which they distributed the following year. Among those which received a first-class certificate, and which was indeed quoted at a higher price than any other, was Mrs. H. Cannell, with beautiful pure white flowers. Now, this is by all growers (Messrs. Cannell included) regarded as synonymous with Christmas Eve, a variety distributed by the American nurserymen, and sent to this country two years previous to the distribution of the other, viz., in 1885. Another flower is Lady Trevor Lawrence, which is the same as Mrs. Beale and Robert Bottomley, this last coming from the other side of the Atlantic. Several other instances are recorded in different catalogues of the same variety being distributed by an English and an American nurseryman under different names. Included among the number are Mr. Frank Thompson and W. G. Drover, Marvel and Mr. H. Wellam, Charlie Sharman and W. M. Singerly, Mrs. Vannamann and Mr. Addison, with Mrs. J. N. Gerard and Mrs. Dunnett. All this is, no doubt, to be accounted for by the fact that they have been imported direct from Japan, and, therefore, the identical varieties have been distributed on the two continents.

Catalogues Received.

C. E. ALLEN, Brattleboro, Vt.; Seeds and Plants.—P. J. BERCKMANS, Fruitland Nurseries, Augusta, Ga.; Green-house, Bedding and New Plants.—JOSEPH BRECK & SONS, 51, 52 and 53 N. Market St., Boston, Mass.; Vegetable and Flower Seeds, Plants, Implements, etc.—J. G. BUBACH, Princeton, Ill.; Strawberries.—WM. BULL, 536 King's Road, Chelsea, London, S.W., England; Flower and Vegetable Seeds, Bulbs, etc.—LUTHER BURBANK, Santa Rosa, Sonoma Co., Cal.; Novelties, Plants, etc.—W. ATLEE BURPEE & Co., 475 and 477 N. 5th St., Philadelphia, Pa.; Flowers, Plants, Thorough-bred Live Stock, etc.—PAUL BUTZ & SONS, New Castle, Pa.; Florists' Stock.—ALFRED E. COLE, Plainfield, N. J.; Garden, Field and Flower Seeds, etc.—M. CRAWFORD, Cuyahoga Falls, O.; Strawberry Plants.—J. M. EDWARDS & SON, Fort Atkinson, Wis.; Small Fruit Plants, etc.—WM. ELLIOTT & SONS, 54 and 56 Dey St., N. Y.; Seeds.—Z. DE FOREST ELY & Co., 1303 Market St., Philadelphia, Pa.; Seeds, etc.—J. ROSCOE FULLER & Co., Floral Park, N. Y.; Seeds, Bulbs and Plants.—J. C. GIDDINGS & Co., Rutland, Vt.; Northern Grown Seeds.—GILLET & HORSFORD, Southwick, Mass.; Wild Flowers, Shrubs, etc.—HAAGE & SCHMIDT, Erfurt, Germany; Novelties of Seeds.—HIGGANUM MANUFACTURING CORPORATION, 189 Water St., N. Y.; Seeds and Agricultural Implements.—G. D. HOWE, North Hadley, Mass.; Potatoes.—T. S. HUBBARD Co., Fredonia, N. Y.; Grape Vines.—JOHNSON & STOKES, 217 Market St., Philadelphia, Pa.; Horticultural Supplies.—THOMAS JACKSON, Portland, Me.; Fruit Trees, Evergreens, etc.—Geo. S. JOSSELYN, Fredonia, N. Y.; Grape Vines, Small Fruit Plants, etc.

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The Sugar Maple.

THE illustration on page 167 represents the Sugar Maple as this tree often appears when it stands in an isolated position on a New England hill-side. The subject of our illustration is in its prime, and shows the habit of the Sugar Maple at that period of its life when it has lost the rather narrow upright growth which often characterizes it during the first seventy-five years of its life and before it has taken on the broad-branched spreading habit certain individuals of this species assume in old age when soil conditions are specially favorable to their very best development.

The Sugar Maple is one of the finest of the deciduous-leaved trees of North America. It is by far the noblest of the American Maples, although the Silver Maple develops occasionally a greater trunk-girth, and it is perhaps the noblest of all the Maples, although the Sycamore Maple of Europe in the mountain valleys of the Tyrol is, when at its best, a tree second to none of its class in spread of branches and dignity of port. But the European Maple lacks the lightness and brightness of foliage and the gracefulness of inflorescence peculiar to the Sugar Maple, while it assumes in autumn none of the brilliant colors which our American tree takes on at that season of the year and which make it then the most conspicuous feature of the landscape wherever it abounds.

The Elm, to many people, is the characteristic tree of New England, because perhaps more than other trees it was selected by the early settlers to stand sentinel over their homesteads; but the Sugar Maple is hardly less characteristic of New England, and of all the Northern States, where it is almost everywhere a very common tree, growing on hill-sides and in valleys, and of late years so generally planted by the road-side that it is now more often seen than the Elm, which is a more fastidious tree than the Maple about its nourishment, more easily affected by drought, and a far more inviting prey to noxious insects.

The Sugar Maple economically is one of the most valuable American trees. The wood it produces is heavy and hard, close-grained, tough and strong. It has a surface which can be highly polished, so that it is an excellent and

much esteemed furniture wood, especially those peculiar forms with twisted and contorted grain known as birdseye maple. It is from the wood of this tree that American shoe-lasts are made in preference to that of any other, and it is used in the manufacture of hundreds of other objects, great and small, from the keel of a boat to a shoe-peg. The New Englander who wants to burn better fuel than that afforded by the Sugar Maple must use Hickory. The Indians knew the value of the sap of this tree and soon taught Europeans how to convert it into sugar. The production of Maple-sugar was once a far more important industry comparatively than it is now, although the crop is steadily increasing in bulk and in money value.

The Sugar Maple has one characteristic which very few American trees, except some of the Oaks, share with it to the same degree, and one which, when American forests are managed with the view of getting from them all they can be made to produce, will make it one of the trees most generally employed in the operations of scientific silviculture. It has the capacity to germinate and grow to a considerable size under the more or less dense shade of other trees. Young Sugar Maples form sometimes in the northern counties of this state, in northern Michigan and other parts of the country where this tree is common, the larger part of the undergrowth which has sprung up in the deciduous forests. These self-sown plants, in spite of the shade which, of course, checks their growth, grow with a good deal of vigor and reach a considerable height. The Beech in Europe possesses the same power of growing for many years under and among other trees, and it is for this reason that the Beech is one of the most valuable subjects in all European deciduous-forest operations looking to natural forest-succession—the prime motive of modern scientific forestry. The Sugar Maple is a far more valuable tree in the material which it produces than the European Beech, and American foresters, when we have them, will have good cause for congratulating themselves in the possession of a subject so valuable and so easily managed.

Our illustration is made from a photograph of a tree growing in a rocky pasture at Weed's Mills, in the town of North Sandwich, New Hampshire, at an elevation of a thousand feet above the sea-level. It was taken by Dr. Wm. Herbert Rollins, of Boston, to whom we are indebted for its use.

THE Governor of California has felt impelled to write a public letter to the Senators and Representatives of that state in relation to the criticism in the *Century Magazine* of the present supervision of the Yosemite Valley. It is to be hoped that the Commissioners have a more intelligent appreciation of their responsibilities than the Governor displays, for he makes it plain that he has not the remotest comprehension of the questions under discussion. Such an exhibition in an official of his rank is not an improving one, and yet it is hardly to be regretted that some of his personal allusions were so unjust as to compel Mr. Frederick Law Olmsted to make a formal statement which explains his early connection with the administration of the valley and his attitude in relation to the present criticism, for Mr. Olmsted takes occasion besides this to state some of the obligations of government when it assumes the duty of preserving natural scenery. After saying that the remonstrance in the *Century* points to nothing in the methods of the Commissioners that would be objectionable if the concern of the nation in the matter were of the same kind that it is with the state's dealings with mineral deposits, irrigation, schools, railroads or even forests, Mr. Olmsted adds:

"If the Governor and the Commissioners are in error, their error probably lies not in any intentional disregard of the state's obligation, but in overlooking the fact that in natural scenery that which is of essential value lies in conditions of a character not to be exactly described and made the subject of specific injunctions in an Act of Congress, and not to be perfectly discriminated without other wisdom than that which is gained in schools and colleges, counting-rooms and banks.

Such qualities as are attributed by the Governor to his Commissioners—integrity, general education, business experience and what is comprehensively called good taste—do not, in themselves, qualify men to guard against the waste of such essential value, much less do they fit them to devise with artistic refinement means for reconciling with its preservation, its development and its exhibition such requirements of convenience for multitudes of travelers as must be provided in the Yosemite. Whether it is the case with these Commissioners or not, there are thousands of such estimable men who have no more sense in this respect than children, and it must be said that those most wanting in it are those least conscious of the want. Men of the qualifications attributed to the Commissioners are the best sort of men for the proper duties of an auditing and controlling board. There could be no better men for the usual business of a board of hospital trustees, for example. But the best board of hospital trustees would commit what the law regards as a crime if they assumed the duties of physicians and nurses. Ability in a landscape *designer* is, in some small degree, a native endowment, but much more it is a matter of penetrative study, discipline, training and the development through practice of a special knack. Even men of unusually happy endowment and education, who have not, also, the results of considerable working experience, can rarely have much forecasting realization of the manner in which charm of scenery is to be affected by such operations as commonly pass under the name of 'improvements.'

In our view, this doctrine cannot be too strongly or too often insisted upon. If expert training is ever essential to the creditable performance of any work, it is needed in just such cases as this. No one but an artist in the truest sense of the word can select in a landscape the elements which fix its character, or estimate the relative importance of each in the distinctive charm which invests the whole. How to make this beauty available to visitors by artificial construction while preserving and developing in their due proportion these essential natural features is not a problem to be solved by journeymen.

We surrender more space than we usually devote to a single subject to the article below on "Sports," by Dr. Masters, the distinguished editor of the *Gardeners' Chronicle*. The subject is so important and its treatment so instructive and complete that our readers will no doubt prefer to have it entire and at once rather than in a continued form running through two or more numbers.

Sports.*

IT is highly desirable that we should attach a definite signification to this word. Among gardeners it may mean many things, whilst, among botanists, it is restricted to cases of bud-variation as distinguished from variation from seed. In this note we shall use the word in its botanical sense, as applying to a special illustration of that tendency to vary which is common to all living beings. We shall, however, gain a clearer idea of what true sports are by the elimination of certain things which are not sports, though often called so. In the first place they are not seedling variations. Out of a hundred seeds of Lawson's Cypress that are sown it is possible, I suppose, to get ten more or less distinct varieties, besides others which are more or less indistinct. The great variability of this species is now well known, and the seedlings of *Abies subalpina*, Engelmann (*A. lasiocarpa* of Hooker), furnish another illustration of the same tendency. These seedlings may be the result of cross-fertilization between varieties, or they may be reversions to an earlier condition; at any rate, of whatever nature they are, they are not "sports" in the sense here intended.

Next, sports are not mere stages of growth. Most plants put on a different appearance at various periods or stages of their growth, and sometimes these changes are very remarkable. The *Retinosporas* of our gardens furnish us with excellent illustrations. *Retinospora* (or more strictly *Thuya*) *pisi-*

fera exhibits during its growth very different appearances in its foliage. There is the squarrose form and the plumose form, the golden form, the silver form, the pendulous form, the thread-like form, the upright form, and perhaps others. All these, however, are not separate entities; they may all occur on the same bush. If cuttings or if grafts be taken they may be reproduced almost indefinitely.

Barring the mere color variation, these forms are but stages in the growth of the plant, occurring with more or less regularity and in greater or less degree of prominence in all the individuals of the species, as may be inferred from watching the growth of seedlings in a seed-bed.

Other illustrations of variations arising during growth are afforded by the differences often observable in the foliage on the flowering branches as contrasted with that on those branches which bear no flowers. The common Ivy furnishes an illustration. The short contracted shoots of the *Laburnum*, or the Apple, known as "fruit spurs," constitute other examples.

Another form of variation in flowers is that connected with difference of sex. A "pin-eyed" Primrose does not greatly differ in appearance from a "thrum-eyed" one, yet the difference between them is precisely of the same character as that between the variously formed flowers of some species of *Catasetum* and *Mormodes*. So utterly different are the male and female flowers of some of these species that they were at first placed by very competent botanists in different genera. It was only when the protean plants produced all the forms of flowers on one and the same spike, that it was seen that so far from belonging to different genera, they did not even belong to different species. It was left to Darwin to show what this paradoxical variation really means; and now, when we meet with a case of the kind, we say, "Ah! yes; only a sexual form," just as if we had known all about it from our earliest years, and very possibly, in our haste, mixing up, or, at least, not discriminating cases of a different nature. But this is not what we propose to discuss just now; we simply say that these cases, though often so designated, are not sports, at least in our acceptance of the term.

What, then, are sports? We have already characterized them as "bud-variations," but we must give some further indication of their peculiarities: First, as to the suddenness of their production. A tree or a shrub, all on a sudden and without any cause—that is, apparent to the eye—will put forth a bud, which, as it lengthens into a shoot, displays leaves of a different character to any that the plant has hitherto produced, which have no definite relation to any particular stage of growth and which are quite different from any that under ordinary circumstances the plant in question has produced or is likely to produce in future. In short, the occurrence is sudden and unforeseen. Gardeners, of course, avail themselves of these variations. They remove them, bud them, graft them, strike them from cuttings, or, in some way or another, endeavor to perpetuate the variety, and thus have originated our cut leaved Beeches, Maples and Limes. Thus, too, may have originated some of our weeping trees and some of our pyramidal shrubs, though, for the most part, these have, as I believe, originated as seedling variations.

Not only do these variations occur suddenly, but they are very local in their manifestation. One particular shoot "sports," while all the rest remain in their normal condition. It is very different in the case of seedling varieties, where the whole system of branches and leaves is more or less affected.

Another and a most remarkable feature about these sports is, that they sometimes occur simultaneously in widely different localities; thus the same sport of a *Chrysanthemum* "turns up" about the same time, not only in different nurseries in this country, but also on the Continent. This may be because all the plants in question have originated from one and the same stock.

These, then, are the special characteristics of a true sport. Illustrations could be given by the hundred; but neither time nor space permit, nor, indeed, for our present purpose, is it requisite to do so. Whoever will investigate the cause of these sudden outbursts of local variation must, of course, sedulously examine each case for himself according to the measure of his ability and of his opportunity. The circumstances, the history, the progress, the anatomy of each particular sport must be investigated, both absolutely and in relation to similar outgrowths in other plants. Until this is done—and it has not been done yet—any explanation as to the cause of the phenomenon must be a matter of speculation. Still, we can not help guessing, and though we may be wrong in our surmises, at least the process does good by setting us observing and thinking. Observing and thinking are processes

*The notes here published represent the substance of an unwritten address lately given to a society of gardeners. It is necessary to mention this circumstance to account for the form in which they are couched, and for the circumstance that no reference to authorities is made. This was not necessary at the time, as numerous illustrations of the things themselves were on the table. Those who desire to look into the literature of the subject should consult the writings of Meehan, Morren, Naudin and others, and will find an excellent summary in Carrière's "Production et Fixation des Variétés," and in Darwin's "Variation of Animals and Plants."

valuable to all of us, but in a particular degree to those who practice the cultural arts. And so it happens—or, at least, we will hope so—that although the causes which have been assigned for these changes are various, some, perhaps, utterly wrong, others partially so, and all more or less inadequate to explain the whole of the phenomena, yet some advantage may accrue from the discussion. An indirect benefit is better than none at all, and anything which enforces us to take some measure of the extent of our own ignorance is likely to be beneficial. We should never be a bit the better if we simply acknowledged our ignorance, as, indeed, we needs must do in any case, but directly we attempt to find out in what particulars and in what degree we are ignorant, then there is some hope that some portion of our “nescience” may be dispelled. Under this impression we may allude to one or two of the assigned causes of sporting. External causes are those which the gardener most generally invokes. For him a sport is usually the consequence of some alteration in the nutrition of the plant. It gets too much or too little food, or the food is not of a suitable character—containing too much of one thing, too little of another, or the climate is charged with the results observed. It is very convenient to have the weather to blame; it may be too hot or too cold, too moist or too dry, too brilliant or too obscure; or the soil may be at fault, the drainage may be defective, the earth not sufficiently aerated, its temperature too high or too low. Combined action of some of these conditions is, of course, possible, intermittent action equally so, whilst we, in this country, are abundantly familiar, first, with one thing in the way of the weather, and immediately afterward with another. It is, therefore, not surprising if some gardeners, without troubling themselves much to see how the explanation fits the facts, do attribute “sports” to such causes as we have mentioned. To our thinking the objections to this kind of explanation are fatal. External circumstances are, no doubt, potent enough to effect very great changes indeed. We are daily witnesses of them; but they do not produce the kind of change which we know as “sports.” On the contrary, sports occur sometimes when no alteration of external conditions is perceptible, and they do not occur when such alterations are very apparent. Or, again, they appear in one place under one set of circumstances, and at another place, simultaneously, under a different state of affairs; and although all the plants growing together have been exposed to the changed conditions of life, the sporting tendency shows itself in one particular plant only, and in one particular part of that plant, generally only in one bud. With all respect, then, for those who hold these views—and one at least of our most experienced and eminent plant-growers has lately publicly advocated them—we venture to think external causes, however adequate they may be in some cases, are inoperative in such cases as we are considering.

A better explanation is that offered by Darwin, by Naudin and others, according to which sports are due to a dissociation of mixed elements, a reversion to the character possessed by one or other of the ancestors of the plant, perhaps one or two, perhaps an indefinite number of generations ago. Let us recall for a moment what a very composite thing a plant is, even such a one as we call a simple plant. At first it is neutral and homogeneous, a mass of protoplasm—containing cells—at least so it was once said, but the homogeneity of protoplasm is a thing of the past. We don't believe in it now. On the contrary, we believe in frameworks and interstitial fluid, in granules and fibres, in some parts that are alive, others that are dead; some that are stable and immutable, others that are mobile and changeable; in short, we have come to the conclusion that, physically and mechanically, as it was previously known to be chemically, protoplasm is very much “mixed.”

Again, another of our old beliefs has been dissipated. Once we were taught that the cells of plants were closed bags without apertures, and that, while the fluid passed from cell to cell by osmosis, there were no visible pores, and no means of transmitting anything more solid than cell-sap. The passage of protoplasm from cell to cell was not then thought of as possible. But Mr. Walter Gardiner has changed all that. He, and others who have followed in his steps, have taught us how to see the pores in the cell-walls, how to see the passage of protoplasm through those pores from cell to cell, and how complacently to employ the phrase “continuity of protoplasm” in a manner that gives us, at present at least, great satisfaction. These modern discoveries of the composite nature of protoplasm, and of its passage, at certain times and under certain conditions, from cell to cell, seem to us to furnish a clue to the explanation of some of these cases of sporting as they do also in the case of some of those

curious cases in which the stock seems to influence the scion, or the scion the stock, in cases of grafting.

Again, in the life history of a plant there are several stages. There is the neutral stage, when it is, at any rate, so far as sex is concerned, an epicene. Then there is the sperm stage, when our plant consists of a mass of neutral matter, a particular portion of which is developed into sperm-cells, or into what will ultimately produce them. At another time the neutral cells of one portion of the general plant-mass develop into germ or female cells, or it may happen that both sperm and germ-cells may be developed at one and the same time, when the plant has, of course, a three-fold constitution.

All these modifications occur in the course of the life of each individual plant. But each individual plant is, necessarily, compounded of elements derived from its two parents, so that, for illustration sake, if we may consider the original stock to consist of three portions—neutral, male and female, respectively—it is obvious that in the first generation there would be six component elements; in the second, twelve; in the third, twenty-four, and so on. Who can count the generations of plants? It is enough for our purpose if we succeed in showing clearly the composite nature of plants.

This being granted, it will not seem remarkable that occasionally a partial separation takes place, just as a scum may rise to the surface of some mixed fluid, or a sediment fall to the bottom of another. This illustration may, perhaps, serve to suggest the reason for the separation of mixed elements in plants; but that is too speculative a matter for us to enter upon here. It will be better for our present purpose to note one or two examples of dissociation of mixed characters wherein both the fact and its explanation are clear. One of the most interesting is that narrated by Mr. Noble, the originator of the white form of Jackman's Clematis. Noble's Clematis, as we may here shortly call it, is the result of a cross between Jackman's Clematis and *C. patens*. Soon after this Clematis was sent out, some dissatisfaction arose because instead of producing flowers of good form and purity of coloring, more or less misshapen blooms of an unattractive appearance were formed. The matter was mysterious. The raiser was blamed by those who did not know that he is a highly competent man in his business, and one whose integrity is beyond question.

The plant was condemned. Fortunately, however, the edict was not carried out in its entirety—some specimens were left. These were watched, and in due time afforded the explanation of the mystery. Jackman's Clematis flowers in the autumn on shoots formed during the spring and summer—on the new wood, as gardeners say, just as happens with a Rose. *Clematis patens* flowers in spring on shoots that were formed during the previous summer, on the old wood, in gardening phrase. Now, when Noble's Clematis came to be scrutinized, it was found that it produced two kinds of flowers—those which expand in spring are solitary, semi-double, never white, but bluish gray, like those of *C. patens*. Those which unfold in autumn are produced in pairs and are single, like those of *C. Jackmanni*, but white. In the spring no flowers of the Jackmanni type are ever seen, and when the old wood is cut away, and only new wood thus suffered to produce flowers, no blooms of the Patens character are seen, but only those of the Jackman type.

Another very interesting case of unmixing, or, if it be preferred, of partial mixture, is afforded by Neubert's Berberis. This is a hybrid between the evergreen pinnate-leaved Mahonia and the deciduous, simple-leaved *Berberis vulgaris*, and it bears leaves some of which are intermediate in appearance, while others are like those of one or of the other of its parents.

The two illustrations above given are instances of the results of cross-fertilization, in which the whole process has, so to speak, taken place under our own eyes. But for how many centuries has the Chrysanthemum, we will say, been crossed and recrossed and crossed again? This process of crossing seems destined to come to an end because the flowers, after a time, become sterile, owing to the fact that the stamens and pistils, one or both, are imperfectly or not at all developed. Seedling variations in such cases must become more and more rare as the process of sterilization becomes more and more marked. If new seedlings are desired, raisers will have to go back to less highly modified flowers, to flowers, that is, which are more nearly in their original condition. But although the production of varieties in the Chrysanthemum by fertilization is thus limited, the development of sports by bud-variation may, and probably will, still go on, to the delight of the grower and the interest of the student. It must, however, be said that at least in the case of the Chrysanthemum the change is sometimes very slight, depending solely on the

presence of coloring matter in some cases and on its absence in others. The form of the flower and of the foliage in many of these *Chrysanthemum*-sports is in no wise different from that of the parent plant. This is only an illustration of the fact that all degrees of combination or of dissociation, as the case may be, may be expected to occur.

Is there any commingling of the elements of stock and of scion in the case of grafts? Botanists and gardeners, almost without exception, have asserted that there is none. Place on a sheet of wet blotting paper, which may represent the stock, a drier piece of the same substance, which may represent the graft, and there will be a passage of the fluid from the lower to the upper paper, but there will be no mixture of the constituents of the two.

We have always wondered if there were no reciprocal influence of stock on scion, why grafting is practiced at all, because we cannot understand the acknowledged advantages of the practice except upon the supposition of some modification being exerted. Gardeners triumphantly, as they were quite justified in doing, pointed to the millions upon millions of cases where no such modifications are visible. Botanists pointed to the closed cells from whose cavities only the thinnest of liquids could exude and permeate through the walls of adjoining cells. This was before the days of "continuity of protoplasm," as above mentioned. Now that we know that not only water, but protoplasm itself, may, under certain circumstances, pass from cell to cell, the difficulties in the way of conceiving that any influence could be exerted on the scion by the stock, or vice versa, are very materially lessened, if not entirely removed.

But before the time we speak of, there were some alleged facts which, provided the history given were true, could only be explained on the supposition of the commingling of elements by grafting and subsequent separation. In other words, the possibility of graft-hybridization must be assumed. Whether it has been proved is another matter.

One of the strongest cases in its favor that we know of is that of the famous Adams' *Laburnum Cytisus Adami*. We cannot go into detail as to the history of this extraordinary tree. It must suffice to say, that it is stated to have originated from the implantation of a bud of the dwarf, shrubby, lilac-flowered *Cytisus purpureus* onto the common *Laburnum*. Be this as it may, we have in our gardens on this side of the Atlantic trees which every year astonish the beholder by producing, together with the foliage and flowers of the *Laburnum*, tufts of *Cytisus purpureus* and all sorts of intermediate conditions between the two. If the stock exerted no influence on the scion, the buds should be pure *Cytisus purpureus* and pure *C. Laburnum*, without any intermediate forms. It would lead me too far to give other illustrations of the production of shoots of an intermediate character between stock and scion. Many such are on record, and many have come under my own notice. It must suffice for me to show that whilst we may, with a very great amount of probability, attribute the existence of some sports to the "un-mixing" of elements blended by means of cross-fertilization, whether between species (hybrids), or between varieties (cross-breds). We may, likewise, but with a less degree of probability, attribute the existence of others to a similar dissociation in the case of grafted plants.

Obviously the latter cases must be much less numerous than the former, and are purely artificial productions, not likely to occur in Nature.

Other assigned causes appear to me to pertain rather to variation in general than to that limited, localized form of it which is here considered as bud-variation, and may be here passed with the mere mention.

Maxwell T. Masters.

London.

New or Little Known Plants.

Syringa Pekinensis.

THIS plant (Fig. 30) flowered in the Arnold Arboretum and in one or two other gardens near Boston last June for the first time, having been raised from seed sent from Pekin by Dr. Bretschneider.

Syringa Pekinensis is a wide-spreading shrub with slender branches covered with light yellow-brown bark, marked with minute wart-like excrescences, and rather stout winter-buds, with broadly ovate, blunt, membranaceous, chestnut-brown scales, with scarious, ciliolate margins. The terminal bud, as is the case always with the common Lilac, does not develop. The bark of the principal stems is thin and light yel-

low, separating into delicate flakes, and is not unlike that of a young Yellow Birch-tree. The leaves are ovate or deltoid, obtuse or acuminate, rounded at the base or gradually contracted into a slender-channeled petiole. They are dark green, opaque on the upper, and rather paler on the lower surface. The inflorescence is a short, compact thyrsus, only four to six inches long, surrounded and much covered by the shoots of the year, which complete their growth before the flowers open. These are white, with a membranaceous, nearly entire calyx enclosing the short tube of the corolla, and emit a disagreeable odor not unlike that of the flowers of the common Privet, which they much resemble.

Mr. Hemsley refers *Syringa Pekinensis*, in his enumeration of Chinese plants, to *S. Amurensis*, and judged by the plants in cultivation in the Arboretum, he is doubtless correct in doing so, although, from a garden point of view, the habits of the two plants are so dissimilar that it may be well, perhaps, for cultural purposes, to retain the two names. The flowers of these two plants are indistinguishable, and the leaves vary only in size. The color of the bark of the branches is the same in both, and so are the scales of the winter-buds. *Syringa Pekinensis* has, however, much more slender branches than the Amoor plant; the winter-buds are smaller, and its whole habit and appearance are lighter and more graceful. The inflorescence is smaller, more compact and less showy. *Syringa Pekinensis* is evidently not free-blooming, in its young state at least. The plants were ten feet high in the Arboretum before they flowered at all, and when a few of them did flower at last, these large plants bore three or four small panicles only.

Syringa Pekinensis, judged by the little that is now known of it in gardens, is the least valuable of all the Liliacs as a flowering plant. It is very hardy, however, and grows rapidly, and its habit is good. The plants all show a tendency to develop pendulous branches, and it was one of the Arboretum seedlings, in which this tendency was rather more strongly developed than usual, which was the origin of the so-called "Weeping Lilac," which has been unduly extolled, in view of the fact that nothing was known at all until last year about the flowers. Now that the plant has flowered, it is seen how very far it falls short of what has been claimed for it.

C. S. S.

Foreign Correspondence.

London Letter.

ROYAL HORTICULTURAL SOCIETY.—An exhibition of more than ordinary interest was the result of the meeting held on Tuesday last at Westminster. Orchids were represented by large groups of Dendrobiums, among which the following were conspicuous: *D. Aspasia* ×, raised by Messrs. Veitch from *D. aureum* and *D. Wardianum*. It has the pseudo-bulbs and habit of the last named, and large, prettily marked, fragrant flowers, in which the colors and form of both parents are blended; *D. lituiflorum superbum* (Sander & Co.), remarkable for the large size and deep color of its flowers; *D. signatum* and *D. Smillie*. Well flowered plants of *Phajus tuberculatus* and a beautiful example of the new hybrid raised by Mr. Cookson from the last named and *P. Wallichii*, were among Mr. Sander's exhibits, as also was a plant in flower of the rare and elegant little *Cypripedium Schomburgkianum*, which has been lately introduced from the regions of the Roraima in British Guiana. A charming variety of *Odontoglossum Pescatorei*, named *melanocentrum*, bearing a stout, branched spike of flowers, which are large and pure white, with a blotch of purplish crimson on the base of the lip, came from Mr. Tantz, of Hammersmith. *Lycaste Skinneri*, Young's variety, is distinct and decidedly pretty in the tinting of its flowers, which are of medium size, pure white, the lip and petals tinged with a pale coppery hue. Several hybrid *Cypripediums*, interesting only as hybrids, but of no beauty, were exhibited, and a plant of the singular hybrid *Cymbidium*, raised by Messrs. Veitch from *C. eburneum* and *C. Lowianum*, was also shown in flower. A collection of plants sent from Kew comprised *Godwinia gigas* in flower, the spathe deep purple, boat-shaped, twenty-one inches long and six inches wide; *Dracontium*

Carderi, like the *Godwinia*, but smaller; *Arisæma speciosum*, large examples; and *A. præcox*; a large specimen of *Tacca ariocarpifolia*, with flowers on stalks eight feet high, and the subject of much interest and speculation, most people being unacquainted with it; *Strelitzia Nicolai*, the flower-spike bearing its large, strangely formed, white and blue flowers; *Buphane toxicaria*, the poison-bulb of the Kaffirs, bearing a head of flowers a foot across, and suggesting some of the *Hæmanthi*; *Echmea glomerata*, whose large, stout spike of blue flowers, springing from compact, cushion-like clusters of scarlet bracts, is both handsome and singular; *Brownea Ariza*, a fine head of rosy red flowers; *Rondeletia amæna*, a handsome stove shrub, with large, oblong leaves and compact terminal bunches of pale flesh-colored flowers.

A double-stemmed plant of the new and delightful little

now a most successful breeder and grower of these plants, many of his seedlings being almost, if not quite, equal to the best hitherto raised. The majority, however, of the very best among garden *Hippeastrums* we owe to the skill of Messrs. Veitch, of Chelsea, who have raised an enormous number of kinds since they commenced operations with these plants, twenty-three years ago. In a paper read by Mr. H. Veitch on Tuesday last, at the meeting of the Royal Horticultural Society, the subject of *Hippeastrums* and their culture was treated in a most interesting and instructive manner. An exhibit of plants in flower, representing the species, first hybrids and the choicest of the seedlings raised from them, formed a perfect object-lesson, and showed much better than any words could how great an improvement had been made in the flowers by breeding. As an illustration of what can be done by



Fig. 30.—*Syringa Pekinensis*.—See page 164.

Phœnix Rabelini was exhibited, and received, as it deserved, a first-class certificate.

HYBRID HIPPEASTRUMS.—The magnificent garden race of *Hippeastrums* which we now possess is the result of nearly a century's careful breeding and selecting from such of the species as possessed the qualities necessary in a good breeder. According to Herbert, the first hybrid *Amaryllid* that appeared in our gardens was the mule between *H. vittatum* and *H. regium*, which was raised by a nurseryman named Johnson in 1810 and named *Johnsoni*. In the following year Herbert himself raised several hybrids, and in his "*Amaryllidaceæ*," published in 1837, he enumerates thirty-one hybrid *Hippeastrums* which had been raised in England. His observations on this genus and his success in breeding from the species were no doubt the cause of the work being taken up by the late M. Louis Van Houtte, of Ghent, and by the elder De Graaf, both of whom raised many hybrids and crosses. De Graaf the younger is

means of hybridizing and selecting to alter and improve the character of flowers so as to bring them up to the florist's standard of excellence, the exhibit and paper by Mr. Veitch were simply perfection. From the form, substance and color of the progenitors, such as *H. Leopoldii* and *H. equistris*, to those of some of the latest of Messrs. Veitch's seedlings, such as that called *Champion*, is a really marvelous advance to have achieved. *Champion* has a shallow tube of great substance, the segments each four inches wide, the whole flower measuring eleven inches in diameter. Its color is rich crimson-scarlet, with a velvety sheen and a small star of green at the base of the tube.

The species first employed as breeders by Messrs. Veitch were *H. pardinum* and *H. Leopoldii*, both introduced by themselves from Peru. The result of this cross did not prove satisfactory, neither did a cross between the last named and *H. aulicum*. When a mule was crossed again with one of its parents, the offspring were, as a rule, almost identical with the

species, the characters of the mule being scarcely shown. The most important "break" was obtained by crossing *H. Leopoldii* with a seedling named Empress of India, these two yielding a race which Messrs. Veitch at once saw was capable of being moulded into one of considerable garden value. A large number of the most popular kinds have resulted from this cross. A serious defect in the earlier hybrids, which runs through almost all the species of *Hippeastrum*, is the large star-like blotch of green at the base of the tube, giving the flowers a coarse and sometimes ugly appearance. To get rid of this defect has been the aim of Messrs. Veitch for some years, and that they have succeeded was abundantly evident in the varieties exhibited.

A race of kinds which flower in the autumn was the outcome of breeding from *H. Leopoldii* and *H. reticulatum*, the latter a free-flowering plant of elegant habit, with a broad band of white along the mid-rib of the leaf. It blooms in September and is evergreen. In the progeny of these we have such handsome seedlings as Mrs. Garfield, Mrs. Lee and Autumn Beauty.

Of the thirty-eight species of *Hippeastrum* recognized by Mr. Baker in his recently published monograph, only very few are now in cultivation in England. Invariably, when a race of any genus has been obtained in gardens and is superior in horticultural characters to the species themselves, the latter are allowed to drop out of cultivation. Efforts have been made at Kew to procure all the species possible, but so far there are only thirteen species represented.

The cultural directions given in Mr. Veitch's paper are of special value—nowhere are these plants grown so well as at the Chelsea Nursery, where a large house is devoted to their culture, and where the plants, when in flower, form a magnificent picture. Whatever may be the case in America, here in England the *Hippeastrums* are often a failure in ordinary gardens. The chief cause of failure is, no doubt, the same as in the case of many bulbous plants—namely, neglect to allow the plants sufficient rest by withholding water and exposing them to sun and air. Excessive watering is, as Mr. Veitch stated, most fatal to these plants. They like plenty when in active growth, but it must be entirely withheld during the season of ripening and rest.

The soil recommended by Mr. Veitch is two parts loam, one part rotten cow-manure and one part sand, the whole to be mixed and exposed to the air for about three months before it is used. Pots should always be small in comparison with the size of the bulb, and they should be well drained. The plants are repotted annually by Messrs. Veitch, though some growers prefer to repot only every two years. All the soil is shaken off the roots, the dead ones cut away and any rotten scales removed from the bulbs. This is done in January, when the plants are repotted. They are placed in a temperature of fifty-five degrees Fahr. for a fortnight and then plunged in a bed of tan, the temperature being raised five degrees higher. Air is given on all bright, warm days, but the plants are never shaded. The flowers develop within about ten weeks after the plants have been repotted. When they have ceased growing the plants are taken out of the tan, less water is given, and the house is kept drier and more airy.

London.

W. Watson.

Cultural Department.

The Potato.

THE first great advance in perfecting the quality of the Potato was made in the production of the Mercer variety, which was named after the county in New York where it originated. Being large, white-fleshed and mealy, it soon took the preference over the Blueskin, Foxsite and other varieties of the period, and spread throughout the country from Maine to the far west. In time the Mercer deteriorated, became subject to disease, and the plants decayed prematurely.

The potato-rot of 1844 and in later years worked a revolution in Potato culture, mainly through the wisdom of the Rev. Chauncey E. Goodrich, chaplain of the Insane Hospital at Utica, who conceived the idea that to make the tubers hardy they should be reproduced from wild Peruvian and Chilian stock. With this view he imported wild tubers in the years 1849, 1850 and 1851, and by cultivation produced in 1853 the Garnet Chili, which became the parent of a long line of hardy, improved, palatable, white-fleshed tubers obtained by hybridization. Mr. Goodrich is credited in Europe with having established a new era in Potato growing, from the thousands of seedlings which he tried and distributed for trial. His work was one of pure philanthropy. Other men made large

sums of money out of his valuable novelties, while he contented himself with the good he was doing to humanity. He died poor, when perhaps he ought to have been more provident, as his daughters were obliged to live by teaching.

Wild Chilian Potatoes have also quite recently been tested and found unusually hardy by my correspondent, the celebrated botanist and seedsman, M. Henrie Vilmoren, of Paris, who is celebrated for his zeal in introducing and domesticating wild esculents. Although Baron von Humboldt stated that there were no Potatoes under cultivation in Mexico at the time of the conquest, wild tubers from her mountain lands have been grown in France and in this vicinity. The effect of cultivating wild tubers in a rich soil is shown by a persevering experiment made by Mr. Alfred Rose, of Yates County, New York. About the year 1879 he planted one wild potato of the size of a pea and obtained as a product one tuber of the same size. Such a result would have ended the trial with many; but he planted this little product and obtained a tuber of the size of a large pear, which, being planted, did still better, until in the sixth season there was a product of nine tubers, the planting of which, in the seventh summer, yielded nearly two bushels of smooth, handsome potatoes, weighing from four ounces to a pound each.

The experiments of Goodrich deserve repeating on a much larger scale, and with wild tubers of California, Arizona, Texas, Mexico, Central America, Peru and Chili. Selections of these should be used in hybridization, and their seed-products planted and tested until new, valuable and hardy potatoes are obtained for the table. There was a fortune in the production of Bresee's Early Rose, and this result may be repeated. Our late Secretary, Mr. A. W. Harrison, gave this potato its name from its character and color, and on one occasion he made an exhibition of some of Mr. Goodrich's seedlings in bushels at the autumnal fair of our society, raised by him in Germantown.

Fabulous sums were paid for the Early Rose the year of its production. I have known of \$20 having been paid for a peck, \$3 for a pound and \$2 for a five-ounce tuber, this last by the late Peter Henderson, who produced from it a crop of 450 pounds from 150 plants raised by forcing, sprouting and rooting. By this system, in a hot-bed, 2,000 plants, and almost 2,000 pounds of potatoes, have been produced from one pound, or by measure thirty-three bushels, of Ruby Potatoes, worth at the time \$74.

The value of a new Potato does not depend altogether upon its size, form, productiveness, hardness and taste; for we must also consider the proportion of starch which it yields by analysis, a test of quality which is too seldom employed. On the average a potato will yield in October from eighteen to twenty per cent. of starch and seventy-five per cent. of water, but the former ranges from ten to twenty-three per cent., and the latter from sixty-eight to eighty-two per cent. The starch exists in the largest proportion in October, and diminishes gradually until April, when the loss is sometimes as much as three per cent.

Potatoes should be boiled in their skins if economy is to be considered, as the loss to the water is then only three per cent. as against fourteen where they have been pared; or from two to three ounces in the pound, which is a very considerable waste.

As the Potato plant and tuber contain a large proportion of potash, this alkali is an important element in the plant-food for a crop of tubers. Mr. Harrison grew his valuable crop of Goodrich seedlings on a piece of what was rated as worn-out land, by the aid of an abundant dressing of wood-ashes.

The potatoes of to-day are quite different in appearance from those grown fifty years ago, when their eyes were much sunken, and their surfaces covered with nodules. American tubers are much more symmetrically formed than those of foreign countries in general, and of more uniform size. Very large tubers evince a richness of soil, but are no special advantage to the consumer. Russia produces very large potatoes, but they have deeply set eyes, and are not invitingly-shaped. The tubers of Europe are generally light yellow in flesh; some are very dark-skinned; and the more common shape is short and thick. Selection of shapes for planting should improve the form of the potato, as it has done with the tomato. "Plant the best, and eat or sell the balance," is a rule that holds good for crops in general; but it is a difficult one to secure acquiescence in among the ignorant and improvident. Following just the opposite in Ireland has had much to do with her potato failures and famines. It is a self-denial not to eat the best of the crop, when the lower grades will sprout and grow, but this self-denial pays in the end, whether it be in the potato, Indian corn or wheat.—From a paper read before the Pennsylvania Horticultural Society by Robert P. Harris, M.D.



Fig. 31.—A Sugar Maple in New Hampshire.—See page 166.

Some Hardy Trees and Shrubs.

I HAVE just read the notes of Mr. Jack, under the heading of "Exotic Shrubs in Canada," and wish to say that the shrubs found hardy near Montreal are equally hardy in our dry interior climate. The Yellow-wood (*Cladrastis lutea*) we are surprised to find a true iron-clad during our recent trying seasons. This is remarkable, as we have found no other tree or shrub from the south truly hardy here, and even the forest-trees and shrubs of the New England States fail to endure our hot, dry summers and cold winters. *Rosa rugosa* is perfect here, but this is not strange, as I believe it to be indigenous to extreme east Europe and north-central Asia. We have varieties of it from east-central Russia that do not differ materially from those we have from China and Japan, and we have nearly double varieties which we were told originated long ago in west Asia. One of these has quite large, dark purple, fragrant flowers, with an average of over forty petals. All the Caraganas are perfect here, and *C. arborescens* is decidedly tree-like in habit. Some of the large-flowering dwarf species, top-worked on *C. arborescens*, make very desirable miniature trees for lawns. We have some specimens that attract more attention than any trees on the grounds.

The many varieties of the Bush Honeysuckles from east Europe and north-central Asia are perfect here, and the same is true of all the species and varieties of Philadelphus except those from south Europe and south Asia.

Of the Forsythias we find *F. suspensa* the hardiest, and, if properly trained on a trellis, by far the most ornamental. *Euonymus nanus* is a native of the north slopes of the Caucasus range and of the steppes north of it, and it proves perfectly at home on our prairies. Aside from the conifers, it is the only plant that holds its leaves with perfect color during the whole winter. It fruits with us very abundantly, which, I believe, it does not do in south Europe, and I suspect not very perfectly at Boston or Montreal.

Hydrangea paniculata is perfect in plant and flower with us, and I suspect its original home was north-central Asia.

Tamarix tetrandra we have not tried; but *T. Amurensis* is hardy with us, and a far better plant than *T. Germanica*, which is tender.

Ames, Iowa.

J. L. Budd.

Chrysanthemums in Pots.—I.

AS between planting out Chrysanthemums and growing them continuously in pots, opinions vary. Those who plant, argue that less attention is required and larger plants are obtained. My experience is, that for all purposes continuously pot-grown plants are preferable, and especially is this true of those required for specimen plants; while with pot-grown plants for specimen blooms more substance and better color are obtained.

The methods of growers vary. Some use elaborate compositions of soil, mixed with almost chemical exactness; others are satisfied with any ordinary rich loam, believing, as I do, that it is the after-treatment that counts. Some give as many as three changes, or shifts, before the final potting, which they make in June; others only two, and make the final shift in May. Some rigorously remove all suckers as they appear; others vary their practice with different varieties.

The soil used from the first shift onward should be composed of some good, light, fibrous loam, being turf laid up the fall previously, alternately layered with cow-manure and road-scrappings. If heavy loam only be available, horse-manure had better be substituted. A little lime might be beneficial, but is not essential. What is important, is to have good loam in a moderately dry state and to pack it firmly, leaving the feeding of the plants until later in the season.

Presuming plants are well established in three or four-inch pots by the first week in April, I would shift at once into six-inch pots if intended ultimately for tens, and into seven-inch pots if intended for twelves. The plants should have been stopped once, but if this has not been done, the work should be delayed for a week, until they are somewhat established. Unless there be good light and facilities for airing in the greenhouse, the plants should be moved into a cold frame by the second week in April, plunged in sand and protected at night until all danger of frost is past. The final potting may then begin and it may extend over two weeks, beginning with the earlier and stronger varieties intended for ten-inch pots, giving the weaker-growing varieties and those intended for the largest pots a little more time. I take particular pains to have the pots clean, inside as well as out, and well drained. The soil is packed quite firmly, leaving about two inches for watering or a top dressing, if it should seem necessary. Water

should be given sparingly for a week or ten days, unless the weather be very dry. I would rather return them to the frames so as to be able to lay over a few sashes during heavy rains. This is more important than it may seem, as a heavy soaking before new roots have developed is really injurious.

We plunge the pots in the ground nearly to the rims, three feet apart and four between the rows. Last year a potter made for us circular disks of earthenware, six inches in diameter by one thick, with a bore in the centre two inches wide; these are set into the ground and the pots are placed upon them. This contrivance, simple as it is, keeps the drainage free, as it effectually prevents worms from entering the pots from the ground. The clogging of the drainage in pots by worms has always been a great obstacle to growing plants in pots, especially during the feeding season, when free passage of water is essential.

I hose my plants freely after bright days during June and July—a practice which keeps the plants clean, and which seems beneficial in other ways which I cannot explain.

Wellesley, Mass.

T. D. Hatfield.

Easter Plants.

THE use of flowering plants in special decorations for Easter observances is increasing, and not only in decorations, for it seems in many instances that a Lily or some other plant in flower is preferred to the elaborate Easter card of previous seasons.

The increase of these pleasant customs is, of course, a profitable thing for the florist, though with the extended demand there has also been a great increase in the supply; in fact, the supply may be too abundant, and in consequence lower prices may prevail. But while this class of business counts as an important item in many commercial establishments, it requires much care on the part of the grower. For instance, one may be preparing a large lot of *Lilium longiflorum*, and if so it will be found practically impossible to induce all the plants in a thousand or more bulbs to grow at the same rate, even though under apparently the same conditions, and in consequence the more forward plants must be sorted out and placed in a cooler temperature so as to allow the remainder of the lot to catch up with them; or the slow growers must be hurried by increased heat and feeding. In fact, this sorting operation may have to be gone through several times, so as to bring the entire lot into an even condition by the week before Easter.

There still exists a considerable difference of opinion as to the respective claims of *Lilium Harrisii* and *Lilium longiflorum* for Easter work. Of course it is admitted that for early forcing *L. Harrisii* is superior, and in size of flower it also takes the lead, but for actual beauty and for lasting qualities *L. longiflorum* still holds its own, and its flowers not being pendant the plants can be packed much more readily for transportation.

The Ascension Lily, as it is sometimes called (*Lilium candidum*), is also grown in quantity in some localities for Easter use, and while not so showy as the preceding sorts, is very beautiful, and especially useful for cutting.

Lilium candidum will not bear hard forcing, and consequently should be started into growth so early that it may be kept in a cool house, because when exposed to too high a temperature the loss of the lower leaves usually follows, and thus the full beauty of the plant is lost.

Next in importance to the Liliums among Easter plants may be mentioned the Hydrangeas, the forcing of which has attained large proportions of late years, though the prevalence of cloudy, dark weather during the present season, together with an early Easter, has somewhat upset the calculations of producers. Still, among so large a number of growers near the various floral centres, it is scarcely likely that there will be a Hydrangea famine this year.

As to varieties for forcing, *H. hortensis* and *H. Thomas Hogg* take the lead and in the order named, though the latter is purer in color than the former, and where white is essential, of course it takes first place. *Azalea Indica* in variety is indispensable at this season, large quantities being annually imported from Belgium for this purpose, in addition to the multitude of home-grown plants used in the same way.

The plants imported last fall have not, however, been entirely satisfactory, many of them having been nipped by frost before shipment, and thereby lost their buds.

For early work the favorite varieties are among the following: Deutsche Perle, double white; Fielder's White; Madame Van der Cruyssen, deep rose, and one of the best of its color; Eugene Mazel, red with dark blotch; and for cut-flower work *Indica alba* must not be omitted.

The bright yellow flowers of *Cytisus racemosus* (or *fragens*) are also much appreciated; in fact, this may be said to be the most useful yellow-flowered plant for decorative purposes during the winter and spring months, its long racemes of flowers hanging down or standing out in accordance with the arrangement in view, but always graceful and pleasantly fragrant.

This *Cytisus* is readily rooted during the spring, and if potted on as the roots require more space and pinched back occasionally, will make shapely plants of fair size for use the following season. Lily-of-the-Valley, in flats and in pots, finds a ready sale, as do Daffodils and Tulips, the varieties of the latter that are used in this way being few in number, and comprising about half-a-dozen sorts of those generally used for forcing.

Freesia refracta alba is also to be had in pots, but does not seem to become as popular as Hyacinths. In fact, the market soon becomes overloaded with it, even in the winter. Marguerites and Pot Roses, the latter being mostly of the H. P. and China classes, are also plentiful and in good demand.

Holmesburg, Pa.

W. H. Taplin.

The Spring Garden.

SCILLA ANTI-TAURICA.—Among a number of early flowering Asia Minor bulbs with which Mr. Edward Whittall, the well known collector, favored me last fall, the above, now in flower, proves a gem, being not only very early, but probably the brightest *Scilla* yet introduced. The color is quite as bright as that of *Chionodoxa Sardensis*, and the flowers are as large. The nodding flowers are borne on rather short scapes, but this may be because the bulbs are not well established. This, however, is scarcely a fault, since the flowers cluster prettily among the leaves. A *Scilla* as bright as the *Chionodoxa* and with the superior foliage of the genus is a distinct gain, and lovers of fine hardy plants should note this variety.

Another Anti-Taurian *Scilla* bloomed in February; a very dwarf variety with three leaves and a single scape with a single nodding flower of the color of *S. Sibirica*. This might well be named *S. uniflora* were the name not already a synonym of *S. Sibirica*. The bulbs of this variety are singular in having a thin, reddish skin, like the Hyacinth. A third plant proves to be the early flowered blue Muscari, alluded to in a former article. The *Scilla bifolia* collected by Mr. Whittall proves to be identical with the European *S. bifolia*, having the same slaty blue, upright flowers borne on waving scapes. Blue, white and rose varieties of *S. bifolia* are all choice plants for the early garden. *Scilla trifolia* is another find of Mr. Whittall's, but being in a rather cold spot it has not yet bloomed with me. It perhaps may not be known to some readers of GARDEN AND FOREST that Mr. Whittall is an amateur, long resident in the East, who discovered in his hunting expeditions the richness of the flora of Asia Minor, especially in bulbous plants, many of which were either rare or quite unknown to cultivation. He has taken up the task of having a systematic collection of the flora made for his garden, and incidentally collects a surplus. We are already indebted to him for supplies of *Chionodoxas* in several varieties, Snowdrops, *Scillas* and *Anemone blanda*. Several new Frittellarias have been distributed this season, on which I hope to report soon.

Elizabeth, N. J.

J. N. Gerard.

Double Cropping in the Garden.

IT is not practicable in all gardens to grow more than one crop in a season. Land free from stone and clay, lying high, dry and level, is best suited for such attempts. A good way to begin is to plow in a heavy coat of manure in fall, and in winter or early spring to spread on as much more. This, worked into the soil as soon as it is dry in spring, with plow and harrow, furnishes food enough to carry two crops with the help of special fertilizers applied during the growing season.

Cabbage and Lettuce can grow together in rows three feet apart, the plants of Cabbage two and a half feet apart in the rows, with Lettuce between. Setting a row of Lettuce between each row would double the crop, but would necessitate hoeing by hand. Early Onion sets can be followed by Cucumbers. Onion seed sown in groups of six rows, with the next space left for a row of Celery, is a good arrangement, as the Onions can be off before it is time to bank the Celery. Spinach and Peas (of the dwarf varieties) make a good first crop, to be succeeded by Celery; early Beets and Sweet Corn hold the ground almost too long for the advantage of the Celery crop; Horse-radish set between plants of early Cabbage will come

to maturity after the Cabbage is removed, and make good roots in one season's growth, if a small root six inches long is dropped into a hole eight inches deep every two feet when the rows are three feet apart at least. Early Radish or Spinach, between rows of Horse-radish, leave the ground early and give a long season for the Horse-radish. Beans can follow early Peas if planted by the 1st of July. Cucumbers planted the first week in July may succeed Spinach. Late Spinach can follow early Beets, and two crops of Beets—the last one sown July 15th—are not an impossibility. Two crops of Cabbage—an early and a late—can be grown on the same land, but a good season is necessary, and prompt connection between one crop and the other.

This double-cropping pays only on well-manured land, and should not be undertaken without such preparation. The secret of success is in supplying abundant plant-food to the growing crops, in soluble form, to make a quick growth. Perhaps there is nothing better for such a special fertilizer, applied in May and July, than nitrate of soda—broadcast and hoed into the soil. Its action is rapid and soon spent, and an over-application is a waste, as the plants only appropriate a small quantity. In dry times water must be supplied to carry along the crops. One great drawback in double-cropping is the tramping down and compacting the land, in the work necessary to keep the crops free of weeds and gather one crop, while not injuring the other, especially when both crops grow till July on the same ground. The earlier the first crop is removed the better, and the clearing of one crop before the other is placed in the land gives an opportunity to turn up the soil afresh. Where the horse can be used between rows less hand work of course is necessary, but double-cropping increases very much the area of the garden, and quickly-grown vegetables are much better than others.

West Springfield, Mass.

W. H. Bull.

Phajus tuberculosus.

THE representatives of the genus *Phajus* are rather more than twenty in number, and most of them are worthy of cultivation. This is particularly the case with the species now under consideration, as it is certainly one of the most beautiful in the genus. It has been known to botanical science for many years, and has passed under the generic names of *Bletia* and *Limodorum*. Until about ten years ago, however, it had not been in cultivation, and its appearance was then due to M. Léon Humblot, a young Frenchman, who succeeded in sending plants to Messrs. F. Sander & Co., St. Albans. On the homeward journey many plants died, but the few that were left commanded good prices at the London salesrooms. These have now been further augmented by a fresh importation, which Messrs. Sander received last year through the same traveler, and we may expect that this Orchid will be much oftener seen in future. Several plants from this last consignment are now flowering here in the nursery, and I have thus been able to make the following description from them: The dark green annulated stems, which are not quite so thick as one's little finger, are somewhat swollen at the base, and at the summit bear five or six lanceolate-acuminate, plaited leaves, nine to twelve inches long, and about two inches across in the widest portion. The stout, erect peduncle springs from below the leaves, and in the specimens seen has borne from six to ten large and handsome flowers, the white, twisted pedicels of which are furnished with a pale green spathaceous bract at the base. The broadly lanceolate-acute sepals and petals are pure white, less than two inches long, the former having a slightly raised median keel on the outer surface. To these a striking and attractive contrast is presented by the large three-lobed lip, the side lobes of which form a tube by meeting over the white and slender column. The inner surface of the side lobes is pale yellow, densely covered with deep brown spots, and there are also numerous silky hairs. The much-crisped middle lobe, which is cleft in front, is white, with numerous blotches of pale mauve near the edges, while on the anterior portion of the disc is a raised bright yellow, warty crest, and at the very base almost is a large tuft of erect, pale yellow, silky hairs.

This species is a native of the warm malarial swamps of the interior of Madagascar, and he who would possess it must run the risk of being stricken down at any moment by fever or other diseases, of which there seem to be many, according to travelers' accounts. Indeed, M. Humblot's constitution suffered so much by his last journey into the interior that he came home to France with the expectation of dying, but happily he has again recovered his health. A warm and moist atmosphere are the chief requisites for growing this *Phajus* successfully, the soil being a matter of little moment, as the

plants thrive just as well in peat as when grown simply in moss and fixed on a teak raft. Plenty of water must be given, but the chief danger to be guarded against is letting the soil or moss become sour or sodden by stagnant water. The winter temperature should be kept up to about seventy to eighty degrees Fahrenheit, and this, in conjunction with plenty of moisture as recommended, seems to be all that is of importance to induce the plants to produce their flowers freely. No doubt as this species gets more accustomed to the empiric art of the gardener, it may thrive at a somewhat lower temperature and under less exacting circumstances.

St. Albans, Eng.

John Weathers.

Heuchera sanguinea.—I am pleased to be able to record the hardiness of this plant during the past winter, having left one out without the slightest protection as a test plant. It may be said that the last was not fairly a test winter; but with such plants as are evergreen and have their growing parts all above ground, as in *Heuchera sanguinea*, the fluctuations of temperature are more injurious than a continued period of severe weather, for under the one the plants are often incited into premature growth, and thus more easily killed, while during protracted severe weather the usual accompaniment of a coat of snow is the best possible protection against both sun and frost.

Aubrietia Leichtlini.—This new *Aubrietia* is now flowering with us for the first time, and if proof were necessary of its value as a garden plant other than that contained in the specific name the plant bears, it will be found in the decided bright rose color of the flowers. As is well known, all other *Aubrietias* have flowers of various shades of violet-blue, and their value as spring decorative plants for association with such plants as the varieties of the Moss Pink for spring effect cannot be overestimated. *Aubrietias* supply the one tint lacking in the many varieties of *Phlox subulata*. They are easily raised from seed; but if it is desired to perpetuate any particular variety, this must be done by division and cuttings in fall, as seedling plants vary considerably, especially where more than one variety is cultivated; so, taking into consideration this fact, it is safe to advise that *A. Leichtlini* be propagated by division. We once had a white *Aubrietia* under cultivation, but soon discarded it, owing to the insignificance of its flowers, which were no better than those of the common Chickweed.

Passaic, N. J.

O.

Correspondence.

Some Practices in Grafting.

To the Editor of GARDEN AND FOREST:

Sir.—The art of grafting, like nearly all other arts, has had much new light thrown upon it during the past generation, and some of its abuses have already been pointed out and corrected. There remains, however, something still to do in calling attention to some misuses of the art, which, next to that of the hybridizer, is the most fascinating of horticultural processes. It is well to discuss its scientific side, and show all that can be shown of the almost infinitely varied influences of stock on cion and cion on stock.

It is desirable also to keep in full view the practical, everyday side of the matter. Some friends of gardening in England have fallen into the belief that because many ill-assorted unions of trees are sold and bring loss and disappointment, the whole practice had better be abandoned. Not many will agree with such a sweeping condemnation, but there is good reason to look carefully into the misapplication of the art. When a whole section of a country engaged in fruit-growing finds that a certain fruit grafted on a given stock cankers and fails, we cannot blame people if they try other stocks, and finally settle down to the practice of growing this fruit on its own roots, if it does better so. When a tree is so short-lived on another stock as to be valueless in two or three years, it is folly for nurserymen to continue its propagation in that way. A choice variety of anything grafted upon a stock which is absolutely sure to send up a multitude of suckers and overwhelm it, is a delusion and a loss, and this loss falls heaviest, finally, on the nursery trade.

An instance of this is the budding or grafting of the new varieties of Lilacs upon a stock of common Lilac, as are all those sent out from European nurseries. An example of a good plant on a stock where it will live but a very few years is *Prunus triloba*, the so-called Flowering Almond on Plum or Peach stocks. A mere touch separates the plant from the stock. Another is found in the working of the Rose *Acacia* on *Robinia Pseudacacia* with precisely the same results. So long has this sort of propagation been practiced that I know of many nurserymen, both in this country and Europe, who

have never seen either the Flowering Almond or the Rose *Acacia* on its own roots, and some have even told me that neither would grow in that way. I have had the pleasure of sending specimens on their own roots to the unbelievers. There are really many things that would be far better on their own roots than grafted upon any other stock whatever, and there exists no sound reason for grafting such things at all. Some of this sort are the following: Wier's Cut-leaved Maple, most varieties of Elm and every sort of grafted shrub on stock which suckers, since they can all be layered so very easily. The Plum on Peach stock may serve a useful purpose on sandy soils, but the indiscriminate sending out of budded Plum-trees is working untold harm to the general nursery trade.

The use of a tender stock for plants which must endure a greater degree of cold than the stock can stand is illustrated by the use of *Rhododendron Ponticum* as stock for *R. Catawbiense* hybrids. It has caused considerable losses of this beautiful plant in Massachusetts, and the best growers now see the desirability of raising them all from layers on their roots.

Another plant that is far better on its own roots is the Quince. As grown now, the new sorts of Quince are budded on the common sort, which, after a few years, send up suckers on every side, and these are very difficult to distinguish. Why not grow these choice sorts from layers or cuttings? The double and also the white *Wistarias* are now almost universally grafted on the common purple sort, and they are often ruined by the more vigorous suckers of the stock. Why do we graft such a plant at all, when by getting them on their own roots by layering we can then multiply them ad infinitum, by root cuttings, as easily as we can raise Peas?

Much labor is applied to the grafting of such trees as the Purple, Cut-leaved and Weeping Beeches, which are very difficult to graft out-of-doors, when they might be far more cheaply and better multiplied by layers. I was greatly interested in a well known, huge Beech, in Kew gardens, last season, which has rooted the tips of its immense, horizontal branches into the soil, and produced, at each of these reinforced points, a large and finely formed tree, so that a ring of these now surrounds the plant. The perfect success of these layers showed what could be done by this method in multiplying these fine trees.

The evident truth is that we often take the worse and more expensive way of propagating many useful plants simply through habit.

Cambridge, Mass.

F. L. Temple.

Longevity of the Elm.

To the Editor of GARDEN AND FOREST:

Sir.—There are several of our eastern trees—the Sycamore and the Tulip-tree, for instance—which attain much greater size than the White Elm. But the finest specimens of original growth—noble individuals, whose commanding stature required the lapse of many centuries—were ruthlessly swept off in the times of early settlement; and it happens now that in most of the older parts of the country the champion trees for size are Elms.

Dr. Holmes, who, in his lively way, has "interviewed" various notable individual Elms of New England, gives it as the result of his observations, that the species is not long lived, and he doubts whether any last beyond two or three centuries. Is this limit well substantiated? Data pertaining to the age of a tree are seldom obtainable. All its early years it is in no way conspicuous among its fellows, as is so frequently the case with the adolescence of centenarian claimants; and in such cases questions of longevity are difficult to decide.

There is an Elm in this town whose trunk, in the smallest place between roots and branches, girths nineteen feet three inches; this at five feet from the ground. At two feet six inches high the circumference is twenty-two feet. In 1817 one half of the tree was killed by the burning of a house at close quarters; but the tree recovered, and the only trace remaining is a deep scar upon one side of the trunk. A lady of the vicinity used to tell of having seen in her childhood a pair of oxen running away over the tree which passed under the yoke, springing up behind them! This occurred only ninety-five years ago. This large tree is evidently in its old age, though still possessing considerable vigor.

The Sterling Elm is a notable tree in the pleasant village of Sharon, Connecticut, on the grounds of Mr. W. O. Wheeler. With a spread of 110 feet, the smallest girth of its trunk is seventeen feet. The trunk is very solid and cylindrical, and the tree is in full vigor. Sharon was first settled 150 years ago; and the position of this tree indicates that it was planted. This

was probably considerably after the settlement. I doubt whether this Elm exceeds a century in age; but it has already reached dimensions surpassed by very few.

The Deming Elm is another old tree in the same town. The smallest girth of its trunk, which is quite irregular, is sixteen feet three inches. Its total dimensions, however, are much inferior to the Sterling Elm's, and the tree is evidently in decadence. It was planted "in his youth" by the late Stephen Deming, and he was born in 1780.

Such instances as these indicate that Dr. Holmes' limit is unnecessarily wide, and that the normal age of this rapid growing tree is considerably within the popular estimate.

To show the rate of growth, an Elm by my own house, which is known to be scarcely, if at all, above fifty years old, may be mentioned. Its situation is very favorable—a warm, rich soil, within a few feet of a large spring. How commonly we find that great Elms have seated themselves near some perennial fountain or water-course, at least within reach of their courier roots! This Elm of half a century, with a trunk twenty feet to the limbs, measures in circumference at three feet high, and entirely above the spread of the roots, eight feet six inches.

Amenia, N. Y.

Myron B. Benton.

A Silva of New England.

To the Editor of GARDEN AND FOREST:

Sir.—The earliest Silva of New England is contained in the following lines, which may interest some of your readers. They were printed in 1670 in London in "A True, and Faithful Account of the chieftest Plantations of the English in America, to wit of Virginia, New England, Bermudus, Barbados." The name of the author does not appear, but the remarks which he adds upon the value and use of some of the New England trees, and of their fruits, are copied, with a few verbal changes, from Wood's well known "New England Prospect," published in 1634.

"Trees both on Hills and Plains in plenty be,
The long-liv' Oake, and mournful Cyprès Tree,
Sky-towering Pines, and Chefnuts coated rough,
The lafting Cedar, with the Walnut tough;
The Rofin-dropping Fir for Mafts in ufe,
The Boatmen feek for Oars, light, neat grown Sprufe;
The brittle Afh, the ever trembling Apfes,
The broad fpreed Elme, whose concave harbours Wafps;
The watry fpungy Alder good for nought,
Small Elder by th' Indian Fletchers fought,
The knotty Maple, pallid Birch, Hawthorns,
The Horn-bound Tree that to be cloven fcorns;
Which from the tender Vine oft takes his Spoufe,
Who twines imbracing arms about his Boughs;
Within this Indian Orchard Fruits be fome,
The ruddy Cherry and the jetty Plumb,
Snake murdering Hafel with fweet Saxafrage,
Whofe fpouts in Beer allayes hot Feavers rage,
The Diars Shumack, with more Trees there be,
That are both good for ufe, and rare to fee."

Boston.

F. Skinner.

Recent Publications.

The Fern Flora of Canada. Descriptions of all the Native Ferns of the Dominion, with localities where they grow. By George Lawson, Ph.D., LL.D., F.I.C., F.R.S.C., McLeod Professor of Chemistry, Dalhousie University. Halifax, N. S.: A. & W. Mackinlay.

This is a small quarto of about thirty pages (pp. 221-251), and is evidently an appendix to some other work, perhaps a school Flora of the Dominion. Professor Lawson has paid much attention to Canadian Ferns for many years, and is well qualified to write about them. The book begins with about seven pages of a general account of the nature and structure of Ferns, given in simple style, such as would be easily understood by the children for whose use the treatise has been prepared. Then follow a synopsis of the genera, twenty-five in number, and a plate with illustrations of seventeen of them. An account of the species occupies the remaining twenty-one pages. The descriptions are clear and simple, and have the merit of originality, none of them, apparently, being borrowed from other authors. Professor Lawson seems to have adhered faithfully to the rule of priority in his choice of specific names, even going so far as to take up Oakes' MS. name of *Asplenium platyneuron* instead of *A. ebenenum*. But it is not certain, after all, that Linnæus had this plant in mind when he wrote the name *Acrostichum platyneuron*. Willdenow plainly says that Linnæus' synonymy was all wrong, and the only

specimen of this Fern in the Linnæan herbarium is marked *Polypodium auriculatum*. *Asplenium marinum* is still mentioned as a Canadian plant, although no one has claimed to have found it since Captain Kendal, and although Macoun and Burgess say that the crediting of this plant to New Brunswick "is now known to have been a mistake."

Struthiopteris is kept separate from Onoclea, perhaps well enough. *Aspidium* is replaced by *Polystichum* and *Lastrea*. *Athyrium* is separated from *Asplenium*, and *Dennstædia* is preferred to *Dicksonia* for *D. punctilobula*.

But, of course, Fern-students cannot be expected to agree in nomenclature any more than other botanists, and each one will continue to call species by whatever names he thinks preferable.

Exhibitions.

The Flower Show at Philadelphia.

THE Spring Exhibition of the Pennsylvania Horticultural Society, which was held last week, was very largely attended and in every way successful, although in some features it fell below the standard of previous years. The display of Roses, for example, was not strong as compared with former exhibitions. This, however, was no fault of the growers; but the effects of an unfavorable season were plainly visible. Nevertheless such flowers of Ulrich Brunner as those for which Edwin Lonsdale gained the first prize were well worth mention. Indeed, this variety was superior to all others shown here this year in the qualities which make a first-class Rose. Among other varieties, C. F. Evans showed the best blooms of Magna Charta, Mrs. John Laing, La France, Papa Gontier, The Bride and Merveille de Lyon. Joseph Heacock took the first prize for Perle des Jardins, Niphetos, W. F. Bennett and Sunset. Besides his prize for Ulrich Brunner, Edwin Lonsdale showed the finest blooms of Madame Hoste, Madame Cusin and Madame Gabriel Luizet. The display of Souvenir de Wootton was somewhat disappointing in view of the fact that \$300 in prizes were offered to successful competitors. John N. May, of Summit, New Jersey, Joseph Heacock, of Jenkintown, Pennsylvania, and Coles & Whitely, of Lansdowne, received the first, second and third prizes for this variety.

The display of Orchids in bloom was excellent, especially the collection of Pitcher & Manda, which included some eighty plants of *Cypripedium* and almost as many of other genera. A superb specimen of *Cypripedium Boxallii atratum* with thirty-two flowers was among the gems of this collection. Other noteworthy *Cypripediums* were *C. Selligerum* and its variety *majus*; Pitcher's variety of *C. Harrisianum*; *C. Curtisii*; *C. Lowii*; *C. Enanthum superbum* and some beautiful examples of the snow-white little *C. niveum*. Among the *Cymbidiums* was a good specimen or the dark-colored variety of *C. Lowianum*. A fine specimen of the white *Lycaste Skinneri*, and some choice plants of the fragrant little *Angracum Sanderianum* attracted much attention. David Emery, gardener to Charles Dissel, and Charles F. Evans also received prizes for Orchids.

The spring flowering bulbs were less abundant than usual, but more beautiful Hyacinths than those shown by Henry Surman are rarely seen. The immense Azaleas shown by Robert Wark, gardener to Mr. C. H. Clark; the great mass of *Astilbe Japonica* from Craig & Brother; the White Lilies contributed by C. D. Ball, W. K. Harris and J. W. Colflesh; the Cinerarias shown by Thomas Long; and Pitcher & Manda's group of Anthuriums, were attractive features of the exhibition.

The display of decorative or foliage plants was unusually good. It would be hard to find a better collection of specimen Ferns than those furnished by Thomas Long, gardener to A. J. Drexel. Every one was perfect. A *Gleichenia flabellata* nearly six feet across, *G. dichotoma* of more than half that diameter, *Polypodium aureum areolatum* and *Davallia pallida*, were among the best. Wm. Joyce, gardener to Miss M. L. Baldwin; Robert Wark, gardener to C. H. Clark, and David Lutz, showed fine groups of Palms, Ferns, Dracænas and other plants grown for decorative purposes, and special premiums were awarded to H. A. Dreer and Charles Dissel for collections of foliage plants and Orchids arranged for decorative effect.

One of the remarkable plants of the exhibition was a *Heli-conia aureo-striata* from the gardens of Mr. Drexel, which was shown for the first time in Philadelphia. Another was a plant of *Lilium Harrisii*, the stem of which separated into four branches about four inches from the ground. There were twenty-two buds on all the branches, but only half this number came to perfection. It was grown by Mr. C. D. Ball, of Holmesburg, Pennsylvania.

Notes.

Messrs. Henry Holt & Co. are about to publish an "Introduction to Systematic Botany," by Professor Charles E. Bessey, of the University of Nebraska, well known by the botanies which bear his name in the American Science Series.

The new edition of Darwin's famous "Naturalist's Voyage Around the World," which has just been issued by the Messrs. Appleton, is noteworthy as containing maps and 100 views of the places visited and described. These are chiefly from sketches taken on the spot by Mr. R. T. Pritchett, and greatly add to the interest of the book.

Two noted Australian nut-bearing trees, which have been tested at the University of California, are the *Grevillea annulata* and the *Macadamia ternata*. The latter is an extremely handsome Holly-leaved tree, but of slow growth until well established. It suffered from frost once, but is hardy at Niles. The former is quite tender at Berkeley, and not a success there.

Messrs. A. B. Seymour and F. S. Earle, of Cambridge, Massachusetts, announce the publication of a series of fascicles, under the name of "Economic Fungi," to illustrate the diseases of useful and noxious plants. Each issue is to have a distinctive character, and the first, which is now ready, treats of fifty species. The fascicles will be supplied either in book form or in loose sheets at the price, respectively, of \$3.50 and \$3.

The leaf-blight of Quince and Pear (*Entosporium maculatum*, Lev.) has of late years been increasing in our orchards and nurseries, causing leaves to fall and the fruit to crack. Professor Dudley, of Cornell University, reports that the disease can be controlled in all its stages by the copper solutions, so that the nurseryman or fruit-grower who sprays the leaves of his trees once in two or three weeks during the growing season will probably suffer no loss from this cause.

Consul Fay, writing to our State Department from Stettin, says that the potato crop is one of the best paying in Prussia, and the products therefrom—dextrine, potato-flour, starch, etc.—shipped to the United States from the port of Stettin during the last three months amounted to \$50,000. German manufacturers are at a loss to understand why we purchase these products abroad when we have such immense crops of corn, when it is realized that the percentage of dextrine in corn is fifty per cent. greater than in potatoes.

When the gum drawn from *Ficus elastica* was first discovered to possess economic value no one could have foreseen the myriad ways in which it would eventually be put to use. The most recent, perhaps, and certainly one of the most curious, is reported in the *Engineering and Mining Journal*, which says that experiments are being made in Germany with India rubber pavements. They were first laid on the carriage-road of a bridge at Linden, Hanover, and are now being tested in Berlin and Hamburg with "extremely satisfactory results. India rubber is said to combine the hardness of the stone pavement with the elasticity of asphalt, but does not become so slippery as asphalt."

At the Agricultural Exhibition which has just closed, in Paris, M. Millet, a horticulturist of Bourg-la-Reine, showed a really remarkable collection of Violets. The most interesting were Monsieur Arène, with large, dark violet, velvety flowers; Gloire de Bourg-la-Reine, with very ample, dark green foliage and extraordinarily large, pale blue flowers with rounded petals; Souvenir de Millet Père, with pale foliage and blue flowers; Armadine Millet, with leaves broadly margined with yellowish white and with small, dark blue flowers; Madame Millet, a variety of Parma with large flowers of a tender rose color, very agreeably perfumed, and Swanley White, another variety of Parma with white flowers.

It is well known that when our western districts were first settled the best woods were wasted or put to services for which inferior sorts would have answered, with no thought of their future possible value. This was notably the case with the wood of the Black Walnut, of which a recent writer in the *Commercial Advertiser* says: "Thousands of fine trees were cut down, burned or allowed to rot on the ground, or split up for old-fashioned rail-fences. Now buyers rummage every mile of territory in the state (Iowa) to find logs and put them on the cars to be carried thousands of miles across the ocean to be worked up into furniture for the adornment of European

palaces." It is said that last year between 1,200 and 1,500 car loads of old walnut logs were thus exported.

The Fuchsia, now one of the commonest of garden plants, was introduced into cultivation about a hundred years ago by Mr. James Lee, a nurseryman of Hammersmith, who saw a plant growing in the window of a sailor, who had brought it from the West Indies. The genus had, however, been discovered much earlier, as it was described in 1705 by Plumier, who named it for Leonard Fuchs, a Bavarian botanist of the sixteenth century. According to a writer in the *Revue de l'Horticulture Belge*, the species, or one of the species, known to Plumier was *Fuchsia triphylla*, which was subsequently lost sight of until re-discovered in 1884 on the Island of St. Domingo and sent to Kew for identification. Its flowers are a glowing cinnamon-red, and about an inch and a half in length.

The Eucharis mite (*Rhizoglyphus Robini*) occurs much more frequently on Hippeastrums than is commonly supposed. Mr. Veitch, in his recent essay on these plants, does not, however, recommend the destruction of all bulbs affected with this pest; on the contrary, he states that he has never seen a bulb so badly infested as to be incurable. Excessive watering, in Mr. Veitch's opinion, affords the conditions favorable to the increase of the mite and the destruction of the bulbs, which is only another way of saying, keep the bulbs from falling into weak health, and the mite will not hurt them, although it may be present. At Kew there are large bulbs of *H. aulicum*, which have been in the collection for years and have flowered annually notwithstanding undoubted evidences that the mite is upon them and has been there all along.

One of the most individual and interesting of the many admirable statues which adorn the streets and parks of Paris is Fremiet's "Jeanne d'Arc," in the Place des Pyramides. Nevertheless, after it had stood for a number of years, the sculptor was so dissatisfied with it that he prepared a new statue on the same general lines in the hope that he would be allowed to substitute it for the earlier one at his own expense. His request was refused, however, by the municipality, and if it is true, as recently stated, that the Fairmount Park Association has secured the new statue, they are to be congratulated upon the possession of a work of surpassing excellence and beauty. As shown in drawings that were published last summer in Paris, it preserves the poetic and delicate individuality of the original, while the changes made in the horse, the harness, the pose of the heroine's arm and the form of the standard she carries all seem distinct improvements.

Catalogues Received.

G. J. KELLOGG & SONS, Janesville, Wis.; Large and Small Fruits, etc.—F. W. KELSEY, 208 Broadway, New York; Fruit and Ornamental Trees, Shrubs, Roses, etc.—HARLAN P. KELSEY, Highlands, N. C., and after June 1st, Linville, Mitchell County, N. C.; Plants and Flowers of the Southern Alleghany Mountains.—JOHN LAING & SONS, Forest Hill, London, S. E., Eng.; Seeds, Plants, etc.—F. E. MCALLISTER, 22 Dey St., New York; Bulbs and Seeds.—MCGREGOR BROS., Springfield, O.; Flowers.—THE MAPES FORMULA AND PERUVIAN CO., 158 Front St., New York; Manures.—W. H. MAULE, 1711 Filbert St., Philadelphia, Pa.; Seeds.—THOMAS MEEHAN & SON, Germantown, Philadelphia, Pa.; Ornamental Trees, Vines, Shrubs, Fruits.—H. MEYERS (late Woolson & Co.), Passaic, N. J.; Hardy Perennial Plants, Bulbs, Ferns and Climbers.—THE WM. H. MOON CO., Glenwood Nurseries, Morrisville, Bucks County, Pa.; Fruit and Ornamental Trees, Shrubs, Vines, etc.—A. C. NELLIS & CO., 62 Cortlandt St., New York; Seeds, Bulbs, Plants.—PARK NURSERY CO., Pasadena, Cal.; Roses, Chrysanthemums, Carnations, Fuchsias.—WM. PARRY, Parry, N. J.; Ornamental Trees, Fruits, etc.—PARSON'S & SONS CO., LTD., Flushing, N. Y.; Hardy Ornamental Trees, Flowering Shrubs and Vines.—WM. PAUL & SONS, Waltham Cross, Herts, Eng.; Roses.—CARL PURDY, Ukiah, Cal.; California Bulbs.—W. W. RAWSON & CO., 34 So. Market St., Boston, Mass.; Vegetable and Flower Seeds.—GEORGE RICHARDSON, Lordstown, O.; Oriental Nelumbiums.—JOHN SAUL, 621 Seventh St., Washington, D. C.; New and Rare Plants, Roses, etc.—SCHLEGEL & FOTTLER, 26 So. Market St., Boston, Mass.; Seeds, Plants, etc.—SIEBRECHT & WADLEY, Rose Hill Nurseries, New Rochelle, N. Y.; Palms, Orchids, Ferns, etc.—B. F. SMITH, Lawrence, Kan.; Strawberries.—E. D. STURTEVANT, Bordentown, N. J., and Los Angeles, Cal.; Rare Water Lilies and other Aquatic Plants.—TEMPLE & BEARD, Shady Hill Nurseries, Cambridge, Mass.; Choice Hardy Perennials.—J. M. THORBURN & CO., 15 John St., New York; French Hybrid Gladiolus, Lilies and other Spring Bulbs.—JOHN THORPE, Pearl River, N. Y.; Chrysanthemums.—J. C. VAUGHAN, 88 State St., Chicago, Ill.; Seeds.—JAMES VICK, Rochester, N. Y.; Seeds.—VILMORIN-ANDRIEUX & CIE., 4 Quai de la Mégisserie, Paris, France; Seeds, Bulbs, etc.—A. L. WOOD, Rochester, N. Y.; Fruit Trees, Small Fruits, Shrubs, etc.—D. G. YATES & CO., 5774 Germantown Ave., Philadelphia, Pa.; Evergreens, Ornamental Trees, Fruit Trees, Roses, etc.

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George Thurber.

THE death of Dr. George Thurber ends the career of the most accomplished horticultural writer America has produced. Dr. Thurber was born in Providence, Rhode Island, in 1821, and early became interested in botany in connection with pharmaceutical studies which he took up in preparation for his business as an apothecary, which he conducted in his native city. His love of plants, however, was strong, and brought him into relations with Dr. John Torrey, of this city, then the leader among American botanists and a man whose influence was widely felt. It changed entirely Thurber's career, and secured for him, in 1850, the position of naturalist, to which were added the duties of quartermaster and commissary, of the United States and Mexican Boundary Survey. He was attached to the headquarter's party under command of Mr. John Russell Bartlett, the principal commissioner for the United States, and was actively engaged during four years in exploring the natural products of the country between the Gulf of Mexico and the Pacific Ocean. These journeys extended to nearly five thousand miles, and carried the party into regions which were, at that time, entirely unknown, scientifically. Thurber "was indefatigable," to use Mr. Bartlett's words, "in his exertions to make thorough examinations and complete collections of everything belonging to his department." He discovered many new plants within the limits of the United States and in northern Mexico, where the party made several long and exceedingly arduous journeys. The most interesting of his new plants were published by Asa Gray ("Plantæ Novæ Thurberianæ") in 1854, the name of the discoverer being there commemorated in a new Hibiscus-like plant, *Thurberia thespesioides*, which he had found in Sonora in 1851.

Dr. Thurber, the duties of the Commission being completed, returned to this city and accepted a position in the Assay office, from which he resigned on account of political differences with the authorities, and devoted himself to chemical and botanical studies, lecturing on these subjects at the Cooper Union and before the New York College of Pharmacy. In 1859 he was chosen to the

Professorship of Botany and Horticulture in the Agricultural College of Michigan, a position which he held until 1863, when he became editor of the *American Agriculturist*, of this city. This place he filled with singular success for twenty-two years, when he was compelled, by failing health, to relinquish the active control of the paper, although he continued to contribute to its columns and give it the benefit of his counsel until within a few months of his death. Dr. Thurber's influence as editor of a widely read popular journal was great. His writing was characterized always by sound common sense based on exact knowledge of many subjects, and they did more in his time to elevate the standing of the agricultural and horticultural press of the country than the writings of any other man. He possessed a charming style and a rare facility for explaining the most complex subjects in clear and simple language. This gift made the "Doctor's Talks," which he contributed during many years to the *American Agriculturist*, and which were intended to instruct young people upon scientific subjects, models of their kind. Of horticultural matters he wrote out of a full knowledge, as his garden at Passaic, New Jersey, an experimental garden in the true sense of the word, was one of the most interesting in this country. In this garden he found the pleasures of his later years, and these pleasures he shared with the public through his "Notes from the Pines."

Dr. Thurber's editorial work was not confined to the columns of the *American Agriculturist*. The publishers of that journal were large publishers, also, of books relating to country life, and most of these passed under Dr. Thurber's critical eye, or, in some cases, were entirely rewritten by his hand. He published, in 1859, "American Weeds and Useful Plants," an enlarged and greatly improved edition of Darlington's "Agricultural Botany," which is still the standard work on the subject, and he contributed the articles upon botanical subjects to "Appleton's Cyclopædia." Dr. Thurber's predilections in botany were for what may be called agricultural botany. This led him to make a systematic study of Grasses, and his knowledge of these plants was unequaled for many years in the United States. It was his intention to prepare a monograph of American Grasses, but editorial duties and failing health, undermined by the hardships of the Mexican boundary, compelled him to abandon this undertaking, for which he was otherwise admirably equipped; and of late years he has been able to do little beyond occasional contributions to the press. His very last work, written almost on his death-bed, was published in this journal a few weeks ago.

Dr. Thurber was a man of great knowledge and of the broadest sympathies; kind, faithful and true, generous to a fault, simple in the ways of the world, and always more interested in the welfare of others than in advancing his own interests. His death removes an interesting and picturesque figure, and a man who will never be forgotten by his friends.

THE bill for the protection of forest-lands on the public domain, which was introduced in the House of Representatives by Mr. Dunnell, of Minnesota, embodies substantially the provisions which have been advocated in these columns—namely, the withdrawal of all government forest-land from sale and entry, and the temporary protection of such forests by the army until a competent Commission, appointed by the President, shall report a plan for their permanent administration. This bill goes before a sub-committee of the Public Lands Committee of the House, consisting of Hon. Lewis F. Watson, of Pennsylvania; Hon. Erastus D. Turner, of Kansas; Hon. Joseph M. Carey, of Wyoming, and Hon. John Quinn, of New York. The Law Committee of the Pennsylvania Forestry Association has issued a timely circular calling upon its members to write to any of the representatives on this Congressional sub-committee with whom they may be acquainted, and present such facts and arguments as may be at their command in favor of the passage of the Dunnell

bill. This is good counsel, and we trust that every one who reads this paragraph will promptly act upon it. Some of the bills which will come before this sub-committee are framed for the purpose of facilitating the destruction of the national forests, and they will not lack interested advocates; it is the part of public spirit to make use of every legitimate influence to oppose these pernicious measures and to hasten action by Congress for preserving and maintaining the remnants of the forest on the national domain.

The Parterre, Fontainebleau.

NO royal residence in France is more famous than Fontainebleau, partly because of the palace and the historical associations that cluster round it, and partly because of the beautiful neighboring forest, which, for ages, was the favorite hunting-ground of the court. There is no record of the foundation of the palace, but it was already ancient when Saint Louis, in the thirteenth century, added a tower, which was the only portion suffered to remain amid the reconstructions of François I. Peculiar interest attaches to these reconstructions, for, in order that they might be fittingly completed, the King summoned a number of celebrated artists from Italy and thus potently influenced the development of the art of the Renaissance in France. Henry IV. also added to the palace, and he doubled the size of the grounds, which, in the reign of Louis XIV., were radically remodeled by Le Nôtre. Between his day and ours there have been many alterations both within and without the palace, but the general aspect of the place still largely represents the ideals of the sixteenth and seventeenth centuries.

The gardens are divided into three portions—the Parterre, or garden proper; the English Garden, laid out in the "natural style" and bordered by a lake; and the private Jardin du Roi or Orangery. Our picture shows the Parterre, which is interesting as an example of modern taste in planting applied to an ancient design. Here we have not the so-called "French parterre," which, as recently described in these columns, consists of long beds thickly planted with masses of hardy flowers that are arranged with a care for form and color contrasts, but then allowed to grow in natural luxuriance. We have, instead, a succession of formal beds, such as are very familiar in America, but disposed in a more appropriate way than is often the case with us. From the regularity of all the lines of the design these beds do not seem too stiff and mechanical; and in a general view they do not make inharmonious spots, but blend into long strips of color which effectively relieve without disturbing the reposefulness of the wide lawns. In the picture we seem to read traces of the fact that larger beds, now turfed over, formerly occupied the centre of these lawns; and we feel sure it was well to do away with them.

Of course in our climate such a wide space so simply treated and quite devoid of shade would not be a very agreeable place of promenade in summer, while the grass would often be so burnt as to injure beauty in a distant view. But in the grayer, damper, cooler climate of northern Europe these objections do not hold, and the broad open Parterre is a welcome contrast to the informal English garden and to the adjacent park, the trees of which show in the background of our illustration. The main point we wish to emphasize is, however, that the formal flower beds which are so hideous and disturbing when introduced into a "natural" arrangement, may be entirely pleasing in a formal one. The fact is as true if, instead of a garden so extensive as this at Fontainebleau, we have one so small that even in our climate its openness would be no fault and its grass could easily be kept well watered. Lovers of such brilliant beds could use them to produce beauty instead of discord if they were willing to exchange the curving paths and carelessly grouped shrubs of their little grounds or front yards for straight paths and symmetrically arranged plantations.

Methods of Botanical Study.

FEW persons will take exception to the argument made in your columns in advocacy of botany as a study for the young. But there are different methods of study, and since the "laboratory method" has been criticised it may be well to outline the plan adopted by many successful teachers of the science.

The "laboratory men" place abundant materials within the reach of students, and with a few hints and suitable apparatus require them to proceed to make discoveries for themselves. They first observe, handle, dissect, compare and study

the specimens, and after this they begin to make some use of books. The "laboratory" method includes the study of gross anatomy of plants with the unaided eye or with a simple microscope, as well as plant physiology, where assistance is received from compound microscopes and other apparatus.

In the old-fashioned way the student was taught, or learned from books mainly, a large number of facts, names, systems of classification, etc. This plan is still extensively adopted, as we may infer from the following, taken from the opening paragraph of Wood's "Botanist and Florist," recently revised: "The proper season for the commencement of the study of botany in schools is late in winter, at the opening of the first session after New Year's. The class will thus be prepared beforehand, by a degree of acquaintance with first principles, for the analysis of the earliest spring-flowers." The plan above followed is dull work.

The old method places the pupils in front of a lecturer, who pours information into them, or questions them concerning lessons learned from a book. In the old method the students witness the play; in the new they begin at once to be the actors. To become a good botanist one must depend mainly on his own exertions, and become a self-made man. This depends little on the information imparted by the teacher, but largely on what the teacher induces his pupils to do for themselves. In the old way the pupil gains knowledge mainly; in the new, besides knowledge, he acquires method, confidence, power and enthusiasm.

The science of botany within thirty years has broadened to an astonishing extent. Now we have all that was ever of value to engage our attention in botany, and five times as much more. We still cling to systematic botany as essential, but cannot get along without the plant structure and physiology and the lower forms of plants which the microscope has revealed. This large expansion of the field has led to changes in methods, and we believe to improved methods of study.

The following, from President Eliot's last annual report to the Board of Overseers of Harvard University, is in point:

"During recent years every college teacher has been forced to answer anew the personal questions, what can I best teach, and how shall I teach it? Every man has really been obliged to take up new subjects and to treat them in new methods. There is not a single member of the faculty who is to-day teaching what he taught fifteen years ago as he then taught it. . . . Each teacher has had to recast his own work, each department repeatedly to modify and extend its series of courses."

The laboratory method claims to include a study of plants in the field, forest, prairie and ravine; their morphology, the great variety of ways in which pollen is carried from anther to stigma, the contrivances for keeping unwelcome guests from flowers, where they can be of no use to the plants, the plans by which some plants entice, entrap and feed on insects, the motions of plants, the climbing of roots, leaves, tendrils, the ways in which nature sows, distributes and plants seeds, and many other things not here mentioned.

Dr. Goodale, in "Guides to Science Teaching," says: "The pupil must earn his facts; they are to be placed within his reach, but not in his hands. The technical terms are not thrust upon the student; they are introduced only as they are needed."

I cannot refrain from quoting the following from Dr. Farrow. It is found in *Popular Science Monthly* for March, 1886:

"The position of the instructor is not an easy one. He is under constant restraint, as he must not tell the student, but must, if possible, make the student tell him, the structure of what lies before him. He is in the position of a boxing master who might easily floor his pupil by a single blow, but who must, by the exertion of great prudence and skill, contrive to let the pupil hit him. By a judicious series of questions, suggestions of possibilities or alternatives, the student may be kept in the right track and yet do all the work of advancing toward the truth himself.

"The most serious obstacle, it seems to me, is not so much that boys are not taught biology at school, as that they are not taught to observe, but are, on the other hand, taught to memorize text books, and to regard education as the acquiring of facts in the most rapid and easiest way.

"Patting one on the back and saying, 'Don't you see this?' and 'Don't you see that?' does not tend to produce a very robust mental development."

In the new botany, for which we are speaking a good word, we set pupils to studying plants before books. Before the first lesson each pupil is furnished or told where to procure some specimen for study. If it is winter, and flowers or growing plants cannot be had, give each a branch of a tree or shrub, which may be two feet long. The examination of these is

made during the usual time for preparing lessons, and not while the class is before the teacher. For the first recitation each is to tell what he has discovered. The specimens are not in sight during the recitation. In learning the lesson, books are not used; for if they are used, no books will contain a quarter of what the pupil may see for himself. If there is time, each member of the class is allowed a chance to mention anything not named by any of the rest. The pupils are not told what they can see for themselves. An effort is made to keep them working after something which they have not yet discovered. If two members disagree on any point, on the next day, after further study, they are requested to bring in all the proofs they can to sustain their different conclusions. Give other specimens for the next lesson, keep reviewing, and generalize as details and facts accumulate.

I like to give two species for a careful comparison. For example, naked or growing branches of Elms, Maples, Ashes, Oaks, Box-elders, Beeches, Poplars, Willows, Walnuts, Butternuts, Hawthorns, Cherries, Evergreens, and, in fact, any of our native or exotic trees and shrubs. Discoveries, very unexpected, are almost sure to reward a patient study of these objects. The teacher must not think this time wasted. No real progress can be made till the pupils begin to learn to see, and to learn to see they must keep trying to form the habit from the first, and to form the habit they should make the study of specimens the main thing, as they cannot acquire the habit by the study of books.

These hints could be much extended. After a few weeks, reviews may be made in connection with chapters in some book. I make it a rule to give pupils specimens for study and comparison regarding every chapter in Gray's Structural Botany, before the book lesson is studied. I place no stress on making these investigations in the order in which the chapters of a text book are arranged.

Free use is made of our botanic-garden, the crops in the vegetable-garden, fields and experiment station, and the thickets along the river. Special topics are often assigned, in which each student has to go many times to observe and record observations on his growing plant. I often go with them for this purpose. Illustrations by drawing are a prominent feature of the course from the very beginning.

Agricultural College, Mich.

W. J. Beal.

Exotic Palms in Florida.

OUR last great freeze came on Monday, March 17th, just forty-six years ahead of the time fixed by our weather prophets, and it affords a valuable, though most unwelcome, opportunity of testing the hardiness of our choice exotics.

My thermometer here, in latitude twenty-eight degrees forty minutes, registered a minimum of twenty-one degrees; my neighbor's, twenty-three degrees, in a more sheltered place, and other observers in the vicinity report all the way from nineteen to twenty-five degrees, the last temperature being where a cloud of smoke from burning woods had settled during the night. Young Orange-trees are mostly killed to the ground—many thousands of them, both in grove and nursery—and old trees lose all, or nearly all, their leaves. I know of a single instance where a tree ten inches in diameter is killed to the ground; but, as a rule, the trunks and branches of old trees are uninjured.

Oleanders lose all their leaves, and, perhaps, the smaller branches. A good many young Peach-trees and Rose-bushes are killed to the ground, but the majority escape with moderate injury. Half hardy shrubs, like Cattley Guavas, are often cut back half way; common Guavas, *Eugenia uniflora* (Cayenne Cherry or Pitanga), *E. jambos* (the Rose Apple) and *E. Ugni* (the Chilian Guava) are killed quite to the ground. Soap-trees (*Sapindus Saponaria*) lose their leaves only; but exotic Tecomas (*T. stans*, *T. Capense*, etc.), as well as Rose Geraniums, Hibiscuses and other common ornamental plants, will have to start anew from the level of the ground. The Tea Olive is untouched, and the common Jessamines (*J. revolutum*, *J. humile*, etc.) are a little cut back. *Araucaria excelsa* preserves its main stem, *A. Cunninghami* had to be cut off a foot from the ground, and *A. Cooki* was killed to the ground; both the latter had the protection of small lath-screens.

These instances show the exceptional severity of the weather, and it is gratifying to note what a large number of fine Palms escape serious injury amid the general destruction. Of course our native Palms are unhurt. Cabbage and Dwarf and Saw Palmettos, and an apparently undescribed species of Sabal, which replaces the Dwarf Palmetto (*S. Adansoni*) in dry scrub land of the Lake Region, are frost proof, as is also our Needle Palmetto (*R. hystris*).

The exotic Palms tabulated below as "Hardy" show no injury, or only a trace of frost bite. The "Half-hardy" lose from one-fourth to three-fourths of their foliage. Those of the third class were quite defoliated, and in some cases may, perhaps, be dead, though very few seem to have lost the central bud. In some cases the same name will appear under two headings; this shows that plants in different situations behaved differently. None of the species tabulated had any protection.

HARDY PALMS.—*Cocos Alphonsei*? *C. australis*, *C. australis argentea*, *C. Blumenavia*, *C. Bonneti* (two varieties), *C. campestris*, *C. coronata*, *C. Gartneri*, *C. mamillaris*, *C. Normanbyana*, *C. petraea*, *C. Romanzoffiana*, *C. speciosa*, *C. Yatai*, *C. sp.* (very glaucous, from Entre Rios); *Phoenix Canariensis*, *P. dactylifera*, *P. Leonensis*, *P. Natalensis*, No. 1; *P. Sahariensis picta nigra*, *P. Siamensis* (two varieties), *P. tenuis*, *Sabal dealbata*, *S. flabelliformis*? *S. Ghiesbreghtii*, *S. humilis*, *S. Mauritiiformis*, *S. Mexicana*, *S. Mocini*, *S. speciosa*, *S. umbraculifera*; *Chamaerops Indica*, var. *nigra*, *C. humilis* (in variety), *C. excelsa*, *Erythea armata* (glaucous), *E. edulis*; *Jubaea spectabilis*; *Washingtonia robusta*.

HALF-HARDY PALMS.—*Cocos botryophora*, *C. Datel*, *C. Guacuyule*, *C. Mikianiana*; *Phoenix acaulis dactylifera*, *P. farinifera*, *P. Leonensis*, *P. paludosa*, *P. rupicola*; *Sabal glaucescens*, *S. longifolia*, *S. princeps*; *Brahea dulcis*; *Livistona* (*Corypha*) *australis*; *Washingtonia filifera*.

PALMS WHICH CAN ENDURE BUT LITTLE FROST.—*Cocos capitata flexuosa* (this may be *Syagrus cocoides*), *C. Mikianiana*; *Phoenix cycadifolia*, *P. dactylifera* (from Lower California); *P. dumosa*, *P. Farinifera*, *P. glaucescens*, *P. humilis*, *P. Natalensis*, No. 2; *P. paludosa*, *P. pumila*, *P. reclinata*, *P. rupicola*, *P. Sahariensis picta nigra*, *P. sylvestris*? *P. tomentosa*, *P. Zanzibarensis*; *Acrocomia Totai* (unhurt at twenty-six degrees); *Phopalostylis* (*Areca*) *sapida*; *Livistona Sinensis* (*Latania Borbonica*); *Rhapis flabelliformis*.

None of the Palms here mentioned are injured by cold weather short of freezing, while a temperature of forty degrees, long continued, will kill many strictly tropical Palms.

The behavior of some Palms planted in the forest, having abundant shade and moisture, is interesting. An Orange-tree in such a situation lost every leaf like those fully exposed. So did *Areca sapida*, which endures light frosts, while *Rhapis vinifera* was only partly cut back and *Elæis Guineensis* was untouched; *Arenga saccharifera* retains half its leaves; *Latania Loddigesii* and *L. Commersoni* (*rubra vera*), *Glaziovina insignis* and *Phoenix sylvestris*? *P. cycadifolia* and *P. paludosa* are all unhurt. A *Dypsis* from Moritius loses but one tender leaf. *Caryota sobolifera* endured previous frosts and is now cut back, but a thrifty sucker from its base seems ready to replace it if necessary. *Seaforthia elegans* and four species of *Chamaedorea* and a small *Diplothemium candescens* lose every leaf, but are apparently alive; one *Geonoma elegans* is untouched, while others around it lose all their leaves, a small *Hyophorbe Verschaffelti*, usually tender, by some chance escapes altogether, while several plants of *Oreodoxa regia*, hitherto unhurt, lose every leaf.

A number of Orchids and small Tree Ferns were "naturalized" in the forest and endured the freeze fairly well without any protection except that of the forest itself.

Of those growing on trees, *Lalía anceps*, *L. autumnalis* and *L. majalis*, *Dendrobium nobile* and *Epidendrum cinnabarinum* are all unhurt, *Lalía purpurata* and *L. harpophylla* are somewhat nipped, and *Acropera Loddigesii*, *Chysis aurea*, *Lycaste sp.* and *Calia Baucrana* seem to be killed.

Of those treated as terrestrial and planted in leaf mould on the bank of a small stream, *Cypripedium insigne*, *C. barbatum* and *Dendrobium nobile* are unhurt. *Phajus maculatus*, *P. grandiflorus* and *Calogyne cristata* lose a portion of their leaves. *Sobralia macrantha* loses most but not all of its stalks and *Peristeria elata* (the "Flor del Espirito Santo") loses all its leaves. In the preliminary frost of March 3d, when the mercury reached twenty-six degrees, the *Peristeria* was untouched, though fronds of native Ferns were frozen and killed where they actually touched the leaves of this Orchid. As the thermometer showed twenty-one degrees during this last cold weather, the prospect of permanently naturalizing some choice Orchids in our woods is very encouraging.

Most of my Tree Ferns in similar situations were more or less hurt. Many of them had been recently planted out and the fronds grown under glass might be expected to be more tender than those produced out-of-doors. This proved to be the case, as the youngest fronds were the ones untouched with *Alsophila horrida* and *A. australis*, *Cibotium glaucum* and *C. regale* and *Dicksonia antarctica*.

Oviedo, Orange County, Fla.

Theodore L. Mead.

New or Little Known Plants.

Lycoris squamigera.*

THE plant which has been known to cultivators for several years, under the name of *Amaryllis Hallii*, of which a figure is now given on page 177, was brought originally from China by Dr. George R. Hall, of Bristol, Rhode Island, and has been distributed by the Messrs. Hovey, the Boston seedsmen. It appears to be the same as a rather rare Japanese species of *Lycoris* which was collected by the distinguished botanist, Maximowicz, of St. Petersburg, on the beach near Oyo, in the island of Kiusiu, and was first described by him. It was previously known to Siebold, however, as is shown by his herbarium, and a good figure of it is found under the name of *Natsu-dzuisen* in the illustrated Japanese work, "So-Mokou-Zousetsu" (vol. v., t. 59), by the native botanist Yokoussai. Dr. Hall had it in cultivation in his garden at Shanghai before 1860, and he states that it is often planted by the Chinese in their cemeteries. It may therefore be the same plant that is referred to by Mr. Baker as found in grave-yards at Ningpo and which he thinks will probably prove distinct. The present plant, however, accords very well with the descriptions of *L. squamigera*.

In appearance it strongly resembles the true *Amaryllis* (*A. Belladonna*). The bulb is large and globose, sending up in spring half a dozen bright green leaves, a foot and a half long by an inch broad. These leaves die down in late summer and are succeeded by the flower-scapes, which are nearly three feet high, stout and solid, bearing an umbel of four to seven fragrant flowers within two large bracts. The flowers, on pedicels nearly an inch long, are three or four inches long above the ovary, somewhat decurved, of a uniform light rose color shaded with a peculiar gray. The curving segments are much narrowed downward and unite to form a rather narrow tube nearly an inch long, in the throat of which, above the insertion of the stamens, is a row of short truncate scales. These scales are peculiar to this species and give to it its name. The very slender filaments and style are declined to one side and about as long as the petals.

The plant is of easy cultivation and proves to be perfectly hardy in our New England climate, in this respect differing from all others of its near allies so far as known, though there would seem to be no reason why the other three or four species of the genus, which are also natives of Japan and China, should not be equally hardy.

The genus *Lycoris* is closely related to *Amaryllis*, *Hippeastrum* and *Crinum*, all of which have flowers very much alike in general appearance. *Hippeastrum*, several species of which are cultivated under the name of *Amaryllis*, differs from *Lycoris* in its hollow stems and in its flattened instead of swollen black seeds. Its species all belong to the warmer parts of the American continent. The true *Amaryllis* belongs to South Africa, and, like *Crinum*, has large, round, green and fleshy seeds, and the fruit never opens by valves as in *Lycoris* and *Hippeastrum*. S. W.

Cultural Department.

The Comparative Liability of Trees to Disease.

ONE of the common questions asked by those intending to plant trees or shrubs, either for ornament or utility, is—Which kinds are least liable to disease? The same question is often considered by owners of large estates, railroad corporations, park commissioners or village improvement societies having for their object the obtaining of shade or the pleasing effect of foliage and flowers with the least possible expenditure of after-care and trouble. As generally understood the term "disease" includes the ravages caused by insects as well as those attributed to fungi, and to any other destructive effects of known or unknown origin, except such as are recognized to be the work of rodents or other vertebrate animals.

Any attempt to answer such questions must always be unsatisfactory because subject to many qualifications; and an answer applicable to one region may prove very misleading when applied elsewhere. In catalogues and works on

horticulture it is not unusual to find particular plants recommended as being free from certain diseases. Such observations may be approximately true, or they may merely represent the local experience of the observer biased by peculiar geographical, climatic or other conditions. An instance of this kind is afforded by the large English Gooseberry (varieties of *Ribes Uva-crispa*). When grown in this country the general experience is that the fruit is very liable to be destroyed by mildew, while occasionally gardens are found in which no injury of this nature is detected. Experiences of this kind are common with many plants, and when we say that particular species or varieties are not subject to disfigurement or destruction by disease, it must be remembered that all plants are liable to epidemics of which we may not now have any idea. Such an epidemic may be brought about either by introduction from abroad or by circumstances which suddenly become favorable to its rapid increase. The destruction or introduction of particular kinds of birds is known to have much to do with the increase or decrease of certain destructive insects; and climatic conditions and the vigor of the host-plants are important factors regulating the abundance or scarcity of injurious fungi. It often happens that the disease of a tree may be directly traced to some previous mechanical injury or lack of nourishment which first gave the parasites a foothold.

Many insects devour the foliage of a great variety of trees and other plants. The well known Fall Web-worm (*Hyphantria cunea*) and the polyphagous locusts are examples. Pests which feed so indiscriminately are more likely to be permanently troublesome than those which are known as monophagous, and which confine their attack to one species of plant, or at most to a particular genus. However, all such destroyers are occasionally subject to violent natural checks, and with fungi, a season of much injury may be followed by one or more of comparative freedom from attack. The following brief review of some of the hardy trees merely refers to the north-eastern portion of the United States and Canada.

It will be seen that very few are to be classed as in any degree safe from noxious diseases. It happens that the Magnolias, the first group of trees as classified in our botanies, is also the most remarkably free from injuries by any disfiguring diseases and particularly from attacks by insects. This seems to be true both of our native species which grow from Massachusetts to Florida and also of those exotic kinds in our gardens. Several species of insects are known to feed solely or occasionally on these trees and numerous fungi are recorded; but it is very rarely that the foliage of a Magnolia is noticeably affected. Thus it would seem that the Magnolias wherever hardy are among the best trees to select for ornamental planting where little after care is to be given. Compared with the Magnolias, the Tulip-tree has more insect-enemies. Chief among these is a scale insect reported as sometimes very injurious in the Western States, an aphid which occasionally hurts the appearance of the foliage, and a minute two-winged fly, recently noticed in these pages (vol. 2, p. 604) as disfiguring the leaves by causing brown spots in them. Yet the Tulip-tree is usually counted among those least liable to disease.

The liability of the Lindens to serious attacks by insects is too well known in some parts of New England to need referring to here. The Horse-Chestnut and the Buckeyes, and more particularly the Maples, have a long list of active enemies, but are usually much less liable to serious disfigurement than the Lindens and therefore they are better fitted to be planted as street shade trees and in parks. Fungi sometimes hurt the leaves, especially those of the Horse-Chestnut.

Two Asiatic trees, the Ailanthus and Phellodendron, have so far generally shown very slight liability to serious diseases in this country. Of the hardy trees belonging to the Pea Family, the Locust (*Robinia Pseudacacia*) seems the worst attacked. It is well known that the trunks and branches become sadly diseased by borers. On the other hand, the Honey-Locusts (*Gleditschia*) are, as a rule, remarkably free from unsightly disfigurement of foliage or disease of stems. The Kentucky Coffee-tree and the beautiful Yellow-wood (*Cladrastis lutea*) are even less subject to injury than the Honey Locust, and the Yellow-wood especially harbors very few insects. The Japanese Sophora does not appear to be quite so exempt.

The Wild Cherries, the Mountain Ashes and Hawthorns and other trees of the Rose Family are more or less subject to many of the same insects and fungi which infest the fruit trees of our gardens. The Wild Cherries in particular are preferred by some of the most obnoxious insects.

The Flowering Dogwood (*Cornus florida*) has the merit of being distasteful seemingly to many destructive insects, so that it usually retains unblemished foliage. Equally free from disease is the beautiful Tupelo (*Nyssa sylvatica*); but both it and

* *LYCORIS SQUAMIGERA*, Maximowicz in Engler's *Bot. Jahrbücher*, vi. 79 (1885); Baker, *Amaryllidaceæ*, 40.



Fig. 32.—*Lycoris squamigera*.—See page 176.

the Dogwood are the hosts of many species of fungi. Ash-trees serve as food for a number of common insects, but in isolated situations they appear to be less liable to serious destruction of foliage than Elms. Among the latter there seems

to be but little difference in the value of the different species in regard to freedom from injury. The American species appear to have slightly the advantage. Little of a damaging nature is recorded against the Sassafras and the Catalpas. The

handsome leaves of the latter are sometimes subject to disfiguring spots of as yet doubtful origin.

The Buttonwood-trees (*Platanus occidentalis*) in New England have, in recent years, obtained the reputation of having degenerated and become more liable to disease. For some reason, not well accounted for, the terminal shoots are often killed and the trees assume a tufted appearance. But few insects are known to attack the tree. The Walnuts and Hickories are among those trees which usually have comparatively well preserved foliage, even when that of many other kinds is destroyed. The Black Walnut seems especially exempt from serious insect attacks.

That the trees which are preyed upon by the largest number of species of insects and other parasites are not always the first to show disastrous effects, is well illustrated in the case of the Oaks. In Europe alone there have been recorded about 600 species of insects which live upon these noble trees, and a proportionately large number are probably to be found in this country; and Professor Farlow has stated* that "the list of fungi which grow on Oaks in the United States includes between five and six hundred species." Of course a large proportion of these parasites also live upon other kinds of plants, while many others are only found upon particular species of Oak. Such figures naturally cause surprise that these trees are able to support such a host of ravagers and yet maintain so fine an appearance as they usually do. On the whole, there seems to be little difference in the value of the various species when considered with regard to immunity from serious diseases; and, as no trees can ever fill their place, the Oaks must continue to be planted for ornament as well as timber.

Loudon states that the leaves of Birches are rarely subject to the attack of insects. Nevertheless there are about 300 species of insects known to live on these trees in Europe, and some of them are of quite a dangerous character. It is true, however, in New England, that the Birches seldom suffer severely. Occasionally they may be attacked by such general-feeding insects as the Fall Web-worm. In the vicinity of Boston, a few trees have been defoliated by one or two species of monophagous Saw-fly larvæ, and these, under favoring conditions, may sometimes become destructively abundant.

The Poplars (*Populus alba*, *P. monilifera* and *P. balsamifera*), so commonly planted in some of our cities, have lately acquired, especially in the region about Washington, a bad reputation on account of the destruction of the foliage by the Fall Web-worm and other insects; and dead trunks and limbs too often show the ravages of borers. The Willows are attacked by many of the same insects, and are, as a rule, hardly less subject to severe injury than the Poplars.

Among the conifers we find that the Pines and Spruces of our forests are, at irregular intervals, subject to extraordinary injury and destruction by borers and foliage-devouring larvæ. Fortunately there is less liability to such disasters in ornamental planting, where particular species of trees are usually few or comparatively isolated and insect-eating birds are more abundant than in the woods. Yet in isolated situations the tips of the branches of most of the Pines are often sadly injured by boring larvæ, and fungi are sometimes quite destructive. During the past season an almost universal disease, of uncertain origin, caused the outer ends of the leaves of the White Pines to become brown. The greatest deformity of the Spruces in cultivation is caused by a Hemipterous insect (*Chermes*), which produces large, cone-like swellings on the ends of the branches. The Colorado Spruce (*Picea pungens*) has so far seemed to escape this disease in New England. It does not infest the native and foreign species of Firs, which, when young and in vigorous health, rarely allow disease of any kind to become manifest.

The Junipers are sometimes subject to several hurtful fungi, among them the well known "Cedar Apples." South of New York the Red Cedar and the Arbor Vitæ are sometimes very much injured by the Bag-worm; but north of Massachusetts the Arbor Vitæ is usually one of the trees most free from disfigurement. In recent years the foliage of the Larches over a wide extent of country has been annually largely destroyed by the larvæ of a Saw-fly (*Nematus Erichsonii*), which is supposed to have been introduced from Europe, and which is the worst known enemy of this beautiful tree. The Japanese Larch (*Larix leptolepis*) at the Arnold Arboretum has not yet been touched by this Saw-fly, but the data are not sufficient to warrant the statement that the tree will not be attacked. The Hemlock is one of the most beautiful trees for ornamental planting, and it has few enemies. Sometimes the presence of Red Mites (*Tetranychus*) gives a

portion of the leaves a pale or dusty appearance, but vigorous, well branched, isolated trees are rarely otherwise injured. Our Cypress (*Taxodium distichum*) has no serious enemies recorded against it, and the Ginkgo has so far given a promise of being one of the kinds best suited to those who want trees which do not require to be diligently guarded against destroying foes.

Arnold Arboretum.

J. G. Jack.

Grapes for Family Use.

I HAVE just been asked to name ten or twelve of the best varieties of Grapes for family use to plant in the vicinity of Plainfield, New Jersey. The inquiry comes from a man who has lately moved into the country, but who still retains his business in New York and goes into the city every day. As this class increases every year a reply to the inquiry may be helpful to some of the readers of GARDEN AND FOREST.

It is difficult to give a general answer to such a question, not only because individual preferences vary as to the quality of the different Grapes, but because differences of soil and of location and of the adaptability of varieties to different conditions make an answer which is correct for one place almost worthless for another a few miles away. However, as the soil in the district mentioned is a light sandy loam I will frame my answer accordingly, although in my own heavier clay soil in Essex County I would still name the varieties which I give below.

For early black Grapes I would name, in the order of ripening, Moore's Early, Cottage, Worden and Concord. These are all hardy, vigorous growers and likely to succeed anywhere in the state. The first named I have not found quite as productive as the others, but its earliness compensates for any deficiency in this respect. The quality is very much like that of the Concord, the parent of all the others, while the Worden is the largest and best of them. For earlier kinds than the above I might name Champion and Eaton, but the former is too poor in quality, and the latter has not yet established its true position as a grape for table use.

For later black Grapes the following kinds among Rogers' hybrids are named in the order of the estimation in which I hold them: Wilder, Barry, Herbert, Aminia and Merrimac. These are all first-class in size, thick skinned, meaty, and of richer quality than the preceding and better keepers.

For red Grapes I name Brighton, Delaware, Lindley (Rogers' 9), Agawam (Rogers' 15) and Berckmans. Of these, Delaware and Berckmans are among Grapes what the Seckel and Dana's Hovey are among Pears, small and not vigorous growers, but of first quality. The strongest grower is Agawam, a thick skinned, aromatic, musky-flavored grape, much admired by some and equally disliked by others. It is liable to set poorly, and the Lindley, equal to any in quality, has the same defect. The Brighton never fails to satisfy the most exacting taste, even if not fully ripe.

For white Grapes I name Lady and Martha first, because of their earliness. The latter is the more vigorous grower, while the former has the larger berry and is better in quality, but it wastes very soon after ripening, often before, and the clusters of both are small. Following these comes the Niagara, a larger and far better Grape in every respect; in fact, in my experience, it is the only white Grape I have that is worth the ground it occupies. Pocklington, so highly praised in some sections, is with me a failure in every way. Empire State and Duchess, while of better quality than Niagara, have berries only half as large and are so uncertain that I can only recommend them as an experiment. Lady Washington makes a fine cluster, but it is too late to be depended on in this latitude. Moore's Diamond and Hayes are as yet new—that is, they have not been cultivated long enough to make their good and bad qualities apparent.

I might mention several more in all classes that have some desirable qualities, but the list is large enough to select a dozen varieties from. Still it represents an individual opinion merely and a consensus of opinions gathered from a larger area may be more satisfactory. The New Jersey State Agricultural Society at its annual meeting six years ago voted on a selection of the best six varieties of Grapes. Ten red Grapes were named and eight each of white and black. The four of each color receiving the highest vote were, in the order named: Red: Brighton, Jefferson, Delaware and Wyoming Red; white: Pocklington, Duchess, Lady Washington and Lady; black: Concord, Worden, Moore's Early and Wilder. This vote was based on their value for general use, which included their value as market Grapes. Some kinds named were new and the desire to sell the vines probably influenced some votes. Some members, too, had no experience with all the kinds

*Vice-President's Address, Section F, *Proc. A. A. S.*, vol. XXXVI., 1887.

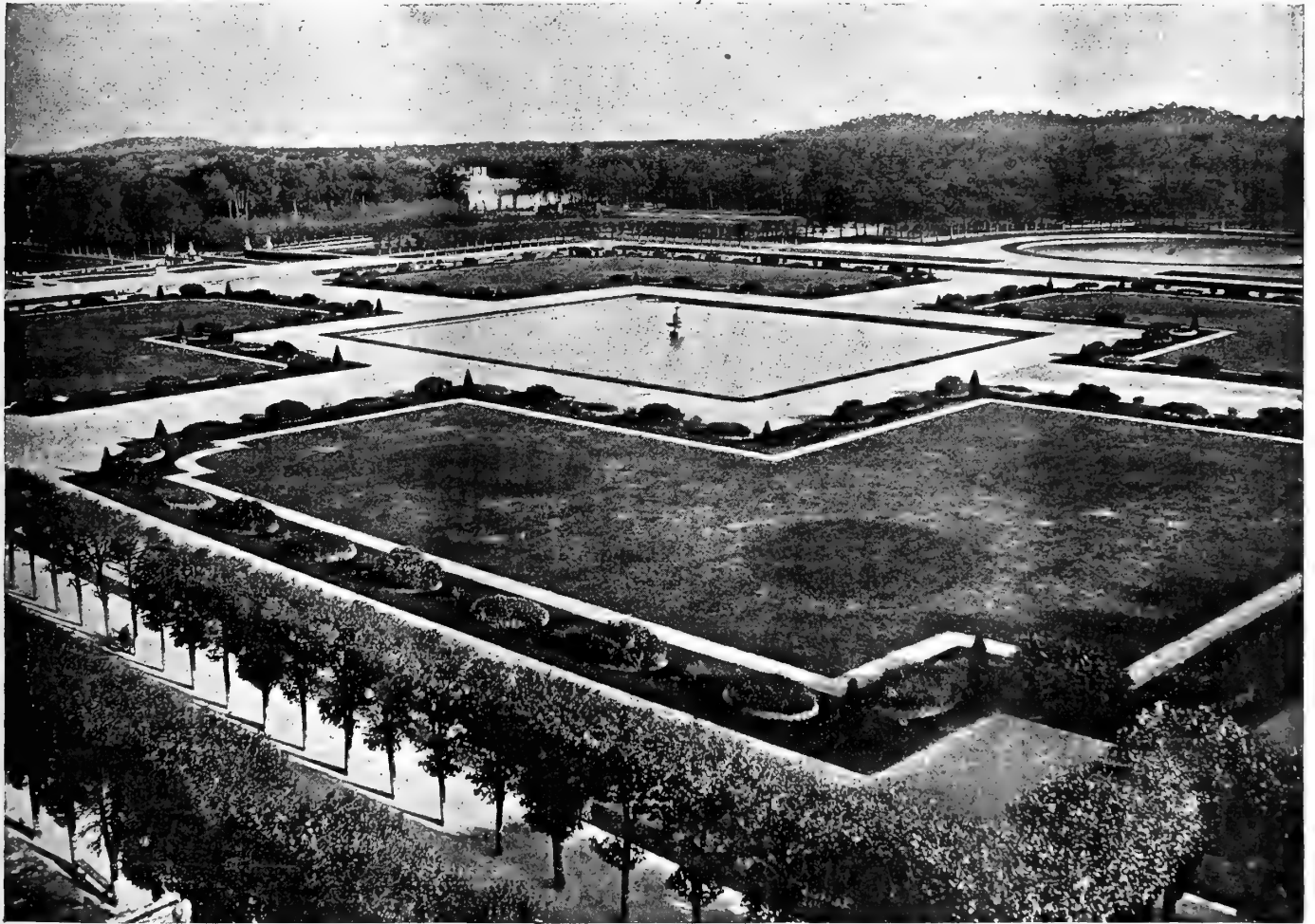
named. At that time Jefferson, Pocklington and Duchess had a fictitious reputation, gained by much advertising. I myself considered the Jefferson a Grape of great promise. Now I would like to change every vine I have. The true value of a really good Grape is not established in three or four years. The Worden, for instance, has been three times as long in obtaining its present standing. Four years later the same Society, balloting for the three best Grapes for general use, one of each color, decided in favor of the Brighton, red; Worden, black; and Niagara, white; and few Grape-growers in the state would to-day make any alteration in the list. The amateur who demands grapes of the highest quality, though fewer of them, and is willing to take extra care to obtain them, might need another list embracing the best of those named above and a few not mentioned here; but for the great majority of the people the list will give entire satisfaction and all the varieties can be grown with ordinary care.

Montclair, N. J.

E. Williams.

garden, which are, nevertheless, as unknown in horticulture as the Stapelias.

The objections urged against the admission of Stapelias into the garden are: (1) that most of them have flowers which smell disagreeably; (2) that they are, as a rule, dingy and unattractive in color; (3) that they are not easily kept in health in the garden. With regard to the first I am afraid that nothing can be said in palliation of the unpleasantness of the odor, except that it is not obtrusive, and people need not smell it unless they like. But both the first and second objections are of small account when weighed in the balance against what can be said in favor of these plants. Their flowers are large, they are often produced in abundance, rarely failing if the plants are in anything like health. In form the flowers are most remarkable, in structure they are full of interest for the botanist, whilst the colors, although quiet, are not wanting in attractiveness, being, as a rule, a mixture of yellow and purple-brown. They cannot be used in the making up of bouquets, nor would



The Parterre, Fontainebleau.—See page 174.

Stapelias.

IN the March number of *Hooker's Icones Plantarum*, Mr. N. E. Brown, of the Kew Herbarium, figures and describes twenty-nine species of Stapelia and allied genera; he also adds in a supplemental chapter some interesting notes on Stapelias in general, and those collected by Sir Henry Barkly when Governor of the Cape of Good Hope in particular. The plants figured in the *Icones* are not, as a rule, of any horticultural interest, but amongst these Stapelias are some which are already known in cultivation, and others which, in our opinion, deserve to become generally known and grown.

Stapelias, however, receive next to no notice from horticulturists; indeed, one might safely say that the number of gardens in which they are grown and the number of gardeners who know anything about them might be counted on one's fingers. To most people this will look like conclusive evidence of the worthlessness, in a garden sense, of all Stapelias. This is true only to a certain extent. It would not be difficult to name many plants of undoubted beauty and fitness for the

any but the eccentric think of wearing one in his button-hole. But there is, or should be, a place in the garden for the anomalous, the strange and the wonderful amongst plants as well as for the pretty, the gaudy and the fragrant. The Titanic *Amorphophallus*, which last year created so much excitement amongst horticulturists as well as botanists, is not a plant to grow "for cut-flower purposes." There are many Orchids, too, of even less beauty and interest than Stapelias, but which find a place in almost every collection. The horticulturist who failed to see anything to admire and long for in *S. gigantea*, with its huge, shaggy star a foot across, and colored yellow with brown blotches, must have a very narrow and unenviable taste for flowers. There are dozens of species of Stapelia with flowers as interesting if not quite so large as this giant of the genus.

The odor was designed by nature to serve the purpose of the plant, man's fastidious senses not being taken into account. Insects are needed to bring about fertilization in Stapelias and that it attracts them is evident enough even here, where flies visit them in large numbers to deposit their ova. Probably,

also, the putrid odor of the flowers is intended to protect the plants from animals, which, if it were not for the smell, might eat them. It is remarkable that whilst the native animals in Africa avoid *Stapelias*, the introduced sheep and goats eat them, and in those parts of the colony where these animals are most abundant the *Stapelias* have been almost exterminated. Apparently the "foreign" animals are not to be deceived by the smell. Something analogous to this is seen in the fruit of the Durian, the smell of which is detestable whilst the flavor is delightful.

Stapelias have long been cultivated at Kew and in a few other gardens in England. Mr. Brown himself has a good collection of them, and there are several amateurs who make *Stapelias* their specialty. In 1811 the Kew collection contained no less than forty-four species, the number of *Orchids* cultivated at that time being only thirty-seven. In 1868 about eighty species had been or were in cultivation in England. Between these two periods richly illustrated monographs and treatises on these plants and their allies were published by Masson, Jacquin, Haworth, etc. In the *Botanical Magazine* alone between thirty and forty species are figured, all from plants cultivated at Kew. At the present time close upon a hundred species are represented by living plants at Kew. Two of the most wonderful—namely, *Hoodia Barklyi* and *H. Bainii*—flowered here about ten years ago. This genus is, however, difficult to keep. *Decabelone*, *Huernia*, *Duvalia* and *Bouceirosia*, all closely related to *Stapelia*, and all equally interesting, are in cultivation at Kew and elsewhere.

Mr. Brown's collection is accommodated in a small greenhouse attached to his dwelling, and his success in the management of these plants has been so marked, whilst the treatment he follows is so easy of imitation, that I quote what he says on the question of cultivation:

"One interesting feature connected with *Stapelias* is the vitality of their seeds and the rapidity with which they germinate. When sown in moist, sandy soil, and placed in a greenhouse heated in summer only by the sun's rays, the night temperature going down to sixty degrees Fahrenheit, or lower, they germinate in less than forty-eight hours. Most of them are comparatively hardy, and under shelter, if the soil is kept dry, will stand a succession of slight frosts of from one to three degrees Fahrenheit, and some will endure as much as eight degrees of frost without injury, if not continued for more than a few hours. I have many plants now living, which I have cultivated for sixteen or eighteen years, that almost every winter have been subjected to a slight amount of frost during severe weather."

Where available, I would recommend the following treatment as better even than that described by Mr. Brown: Summer temperature, minimum, sixty degrees, with exposure to all sunshine. Whilst growing these plants require as much water as ordinary pot plants; they thrive when planted in light sandy loam, well drained. In winter the temperature should not fall below forty-five degrees, and the atmosphere about the plants should be kept as dry as possible. They do not require any water at the roots from November until about the end of March. Should the plants rot at the base the decayed parts must be cut away and the stems must be laid upon sandy soil. *S. gigantea* may be grown in a moist stove all the year round. Seeds of *Stapelias* may be obtained from Continental nurserymen. Mr. Hanbury has a large collection of these plants in his garden at Mentone. Professor Todaro, in the Palermo Botanic Gardens, also grows a considerable number of them.

Kew.

W. Watson.

Orchid Notes.

Lycaste aromatica.—This species may not possess sufficient merit to rank among the most handsome *Lycastes*. It is, nevertheless, a very desirable one, and worthy of the gardener's attention on account of its free habit and large fragrant flowers, which possess the additional recommendation of appearing in great numbers during the dull months of December and January.

It was first introduced from Mexico in 1824 by Lord Napier, and since that time has passed through the hands of botanists under the names of *Colax aromaticus* and *Maxillaria aromatica* until Dr. Lindley consigned it to the genus in which it now stands. From a structural point of view the flowers of *Maxillaria* and *Lycaste* resemble each other very much; hence in gardens many *Lycastes* are known as *Maxillarias*, and *vice versa*. One of the easiest means to distinguish these two genera is that *Lycastes* always have thin, plicate leaves, while *Maxillarias* are recognized by their stiff, flattish leaves, traversed by three to five strong nerves.

Lycaste aromatica has deep green, ovoid pseudo-bulbs, measuring from three to five inches long and becoming more or less angled with age. Three or four oblanceolate, plicate leaves, a foot or more in length, are borne on the summit of each pseudo-bulb, from the base of which spring the slender one-flowered scapes six to eight inches long, having at each node (there are usually four or five) a large dark brown spatheaceous bract. As many as twenty flowers, each about three inches across, are often produced from one pseudo-bulb, and, owing to the olive-green color of the broadly ovate, acute sepals and the bright cadmium-yellow of the smaller erect petals, they present a very striking appearance to the surrounding plants. The lip is three-lobed and colored like the petals, with the addition of several dark red spots at the base and a deeper yellow raised callus on the disc. There is a variety known in gardens as *Punctata*, which may be readily distinguished by having (on the lower portion of the petals) several blood-red blotches, similar to those on the base of the lip.

This *Lycaste* may be grown either in pots or baskets in the usual mixture of fibrous peat and sphagnum. In winter the temperature may range from sixty to sixty-five degrees, Fahr., gradually rising to about ten degrees higher in the summer months. Growth begins in spring and continues until the end of autumn, when the pseudo-bulbs begin to ripen, after which they shed their leaves and produce their flower-scapes. Plenty of water may be given during the growing period, but, as the time of flowering approaches, less and less will suffice. When the blooms have all vanished, the plants require a rest of a month or two, during which time very little is necessary—indeed, only just sufficient to prevent the pseudo-bulbs from shriveling.

Odontoglossum triumphans.—From February until the end of April this is one of the most conspicuous species of the genus. It is usually called a handsome species, and deservedly so, on account of its large, showy flowers, which individually measure over three inches across. From eight to ten is the usual number, borne on an arching scape, two to three feet long. The oblong-acute sepals and the broader petals, with erose or irregularly-toothed margins, are golden yellow, the former having a few large chestnut-brown blotches, the latter being decorated with similar, but smaller and more numerous, blotches. The blade of the lip, which is ovate or cordate-acuminate, with denticulate margins, is folded at the tip, and has a large deep brown blotch on the anterior portion, bordered by a more or less narrow yellow margin, while the lower portion is creamy white, sometimes tinged with yellow, and furnished with a forked, elevated white crest, on each side of which are shorter teeth. The column is over an inch long, pale green at the base, passing into pure white upward, and having on each side of the anther a large, slightly toothed, brownish wing.

O. triumphans is indigenous to the mountains of Colombia, where it grows at an altitude of 5,000 to 10,000 feet above sea level. It was first discovered about 1842 by M. Linden, near Pamplona, and some years later by Warscewicz. The latter, however, thought it was *O. Hallii*, and sent it to Europe as such, and this caused confusion between the two species for some time.

Plants of this species should be grown in a cool house—that is, one the temperature of which in winter varies from forty-five to fifty-five degrees Fahrenheit, rising a few degrees more in the summer months. As much diffused light as possible should be given, and the atmosphere should always be kept moist by means of damping the floors and sides of the house. During growth plenty of water may be given, and when the bulbs are getting ripe as much air as possible should be given so as to assist in the process.

St. Albans.

John Weathers.

Andromeda floribunda.—The mild winter has not brought this beautiful Evergreen into flower much before its usual time. It is just opening its first flowers now, March 25th, not much over a week ahead of last spring. There are so few good broad-leaved Evergreens that will thrive here, that this one is valuable on that account, aside from its great beauty. The small panicles of flower-buds are formed in the autumn, and are usually so numerous as to almost hide the leaves. In this condition they are very pretty, and it is not uncommon for passers-by in the winter to consider the shrub in full flower. A shady place protected by larger shrubs is suitable for this *Andromeda*, and I find a well drained, light soil to suit it well. In such a place it ripens its wood well, and this has a great deal to do with the question of hardiness.

Cercidiphyllum Japonicum.—I have marked this Japanese tree growing in many situations and find that it does the best in

deep, rich soil. The foliage when the tree is in ordinary situations is not over dense, and when on dryish ground it is quite thin. It is only when in deep soil that the great beauty of the tree is developed. It is then that the different colors of the foliage and leaf stalks are best displayed. The leaves are heart-shaped, dark green above and silvery green beneath, while the leaf stalks and veins are of a dark red. It has a well formed pyramidal habit. I am not aware that any trees have flowered as yet in this country. Seeds, however, can be imported which germinate readily, so that the slower way of layering and rooting cuttings will not be necessary.

Germantown, Pa.

Joseph Meehan.

Foxgloves.—It is not generally known that *Digitalis purpurea* and *D. lutea* (*ambigua*) force well. By potting good plants in ten-inch pots during the autumn, and by keeping them in a frost-proof pit, well lighted and aired when the weather permits it, they grow a little all winter, and come nicely into bloom by the first of May. Along with these appear Canterbury Bells and *Spiraea palmata* if treated in the same way. Add to the above a few plants of *Astilbe Japonica* or *Deutzia gracilis* and a very charming group can be formed. For vases or ornamental jars Auriculas and *Viola cornuta* Perfection, can be used with good effect until the time comes for ordinary summer-blooming plants.

Japanese Anemones.—For entrance-steps, porch or piazza decoration few plants excel well-grown specimens of *Anemone Japonica*. Ours are grown in twelve-inch pots, started in a frame during March, which advances them sufficiently in this latitude to bloom toward the end of September. Further south this would be unnecessary. We place five to six strong crowns in each pot, in good loam. As soon as the flower-stems appear in August liquid manure is given. Abundance of water is essential throughout the season; just sufficient staking is done to get good specimens. The best varieties are the white Honoring Joubert and the hybrid Pink.

H.

Wellesley, Mass.

Perpetual Carnations.—Carnations to flower in the open ground this summer should be planted early in this latitude—any time after the 10th of April if they have been growing in a cool place. Carnations are better without fire-heat at this season. It is important that the soil in which they are to be planted be rich in potash, and a liberal dressing of wood ashes is, perhaps, the best means of supplying this element. If the plants are ordinary spring-struck cuttings they should be planted about a foot apart each way; plants that have been wintered over in five-inch pots require more room, and, of course, give more flowers; yet, if the same amount of money is expended in small plants, the additional number should produce the same amount of bloom. The varieties of Carnations are so numerous, and so large a proportion of them are excellent, that it is hardly worth while to name a select list. Unfortunately there are but very few thoroughly hardy varieties of the class known as Border Carnations. Seedling plants will go through the first winter safely, as a rule; afterward, however, whether the plants are layered or stock is obtained by cuttings, the losses are heavy and the plants badly crippled. Unfortunately, we cannot grow the Clove Carnations here as they are grown in England, and where they are among the most satisfactory of garden plants.

Pearl River, N. Y.

John Thorpe.

Correspondence.

An American Arboretum in Germany.

To the Editor of GARDEN AND FOREST:

Sir.—It may interest your readers to hear something of an Arboretum formed by a distinguished German horticulturist, Dr. G. Dieck, in northern Germany, on that great level plain which sinks gradually toward the North Sea, where the winters are rigorous and the summer climate is often marked by excessive droughts. It is a severe climate, of course, for delicate plants, but the more difficult it is to form a collection, the greater the honor attached to it. Plants which can support a climate like that of northern Germany have passed, so to speak, a severe examination; and can therefore be planted in regions of less rigorous climates without danger of their succumbing to the first exceptionally severe winter, as is often the case with plants propagated in a mild climate or in an exceedingly rich soil.

Dr. Dieck's Arboretum, situated not far from Miersberg, on the line from Halle and Leipsic, in the village of Zoeschen, is rich in trees and shrubs from America, and especially in those of the remote and still little explored regions of the north-west

coast. Dr. Dieck, at a considerable sacrifice, sent recently several intelligent collectors into the northern part of Oregon, Washington and British Columbia to explore the rich Cascade Mountains and those of the Fraser River, and his Arboretum now contains a number of rare plants which would be looked for in vain in the richest gardens of the United States. The special merit of Dr. Dieck's methods is to have had seeds of trees, especially of conifers, of an extended north and south range gathered at the most northern or the most exposed station where the particular species grows, in order to make sure, if possible, that the seedlings would be able to resist the climate of the eastern states and of Europe.

Dr. Dieck explains in his Catalogue that all his plants are at the free disposition, gratuitously, if necessary, of botanists who may need them for scientific investigation; secondly, he offers them to botanical gardens and other scientific institutions, and also to private collections, if these have any scientific character; thirdly, they are put in commerce. To have an idea of the value of the plants Dr. Dieck has obtained from the Pacific coast, it is only necessary to examine the list of 120 species, mostly newly introduced, contained in the supplement of his Catalogue for September, 1889. I will add, in passing, that this list contains, also, all the varieties of Roses used in Turkey and Asia Minor in the manufacture of ottar of Roses, which Dr. Dieck has had collected in their native countries. But to return to the novelties from the Pacific coast contained in Dr. Dieck's Catalogue, where are found *Acer glabrum* in three varieties, *Alnus rhombifolia*, *Rhododendron albiflorum*, the beautiful Alpine Rose of the Cascades; *Menziesia glabella*, and *M. ferruginea*, *Celtis reticulata*, *Fendlera rupicola*, *Jamesia Americana*, *Fatsia horrida*, that beautiful Aralia of the Columbia River, which is hardy in our coldest climate; *Lonicera flavescent*, a new species from the Cascades, a new *Opuntia* from the Fraser River, *Pinus ponderosa scopulorum*, the dwarf Alpine form of the Yellow Pine, *Pachystigma myrsinites*, a pretty evergreen shrub from the cold region of the Columbia, the equal of the Japanese *Euonymus*; *Pentstemon Menziesii*, var. *Scouleri*; *Populus trichocarpa*, an elegant Poplar-tree; *Quercus agrifolia*, a semi-evergreen California species; *Rhus aromatica trilobata*, *Rosa Engelmanni*, which is probably a variety of *R. acicularis*; *Rubus ursinus*, *Sambucus arborescens*, a good and very beautiful species of vigorous growth, and not a variety of *S. racemosa*. There is a collection, too, of fourteen Willows from the mountains of the Pacific, which probably no one has cultivated before; on account of its beauty, *Salix tristis*, var. *pallida*, is worthy of mention, and so are *S. Barclayi*, *S. Hookeriana*, and the new *S. Flogeriana*, an ally of *S. pyrolaefolia* of Siberia, an Alpine species with stems spreading on the ground like a green sod over which the roller has just passed; *Spiraea betulifolia* and *S. corymbosa* in dwarf Alpine forms; *Symphoricarpos Floyeri*, *S. acutus*, and two new found varieties, one of which, *S. pauciflorus*, makes a compact little Alpine shrub.

I suggest to all botanists or lovers of trees who happen to be in northern Europe to stop and see this Arboretum and its enthusiastic creator; they will find there much to interest and instruct them. Dr. Dieck, and this is in my eyes his principal merit, does not imitate a great number of commercial cultivators, who only devote themselves to plants which find ready sale. On the contrary, his passion is for difficult genera, often the "common things" of amateurs, which have only a purely scientific interest. For example, he has brought together 350 forms of Wild Roses, and the astonishing number of nearly 450 forms of *Salix*. To increase his *Salicetum* he stops at nothing, and I permit myself in the interest of science to beg the botanists of the United States, who are in a position to procure rare or curious forms of Willows, to send them to Dr. Dieck, whose address is simply Arboretum, Zoeschen, near Miersberg, Germany. Cuttings and plants can be sent easily and cheaply by sample post.

H. Christ.

Bale, Germany.

[Nearly all the plants mentioned as novelties by Dr. Christ have been cultivated for years in the United States. Some of them, like *Rhododendron albiflorum* and *Pachystigma*, are difficult to manage, and the right way to cultivate them successfully has not been discovered yet. The handsome Aralia of the north-west has refused, too, to remain alive for any length of time in gardens. There are still many North American plants to introduce into cultivation, and a few good ones, and the more people there are who make collections of our plants the better. We venture to suggest, however, that some knowledge of what American gardens contain would be useful information to

any one sending out expensive expeditions to collect American plants; and we must protest against the publication in a trade catalogue of new names of scientific appearance for plants which may or may not be undescribed. American plants, and especially those which are in cultivation, are weighed down by a hopeless load of synonyms, and now if this load is to be increased and plants are to be scattered over Europe under inadequately published names, American botanists may have some cause to regret Dr. Dieck's zeal and enthusiasm in increasing his Arboretum.—Ed.]

Common Names for Plants.

To the Editor of GARDEN AND FOREST :

Sir.—In your recent editorial entitled "Botany for Young People," there is one point that, in my judgment, might have received more consideration.

Any one who has paid attention to the so-called "common names" of plants must have been struck with the fact that in the majority of cases such names are not common at all, but are rather names that have been coined by botanists themselves, or names used by a greater or less number of flower-lovers to designate the plant in question. The fact cannot be ignored that a great many people do not accept these common names, but adopt instead local names of their own, names varying in different parts of the country, and expressing the native feeling of the locality toward each particular plant, rather than a common feeling of the whole area over which it is found. Thus there may be dozens of common names for each plant, and flower-lovers from different parts of the country may refer to a plant by very different names, and be unable to discover, except by much explanation, that they are speaking of the very same thing.

The whole subject of the popular or common names of plants is one of the greatest interest. The local name of the plant is apt to be, as I have pointed out, the expression of the feeling of the locality which the plant excites. Therefore it is obvious that dull and untrained observation will find in a plant many false points of resemblance and many qualities that have no existence, and deduce from these a local name that absolutely misrepresents its true nature. For example, the early settlers were naturally keen to discover likenesses between the strange plants of their new home and the familiar plants of the old home left behind. As a result, many of our plants to-day bear names absolutely misleading and erroneous. There may have been, indeed, a good excuse for all this years ago; but can we say that to-day we have a right, not only to use these wrongly given names, but to teach them to our children in preference to names that are more correct?

It seems to me that the advocates of common names are every whit as tyrannical in their requirements as the advocates of strict botanical nomenclature. If a common name is to mean anything it must convey the impression of one plant and one plant only; or, at the most, one genus and one genus only, to the hearer. Now, in such a case what are we to do with all the local names of the same plant? Must we not decree that they should yield to some better recognized popular name, if our common name is to mean anything? This being so, why is there any objection to using the scientific name as being most generally recognized and most accurate? As an illustration, let me name a case already mentioned. Every one knows the pretty *Houstonia*, and no one, I think, finds the Latin name difficult to learn or awkward to pronounce. I was always taught to call it *Houstonia*, and to bear in mind that it was *Houstonia cærulea*, whether I needed to use its specific name or not. Now, the writer in *Saint Nicholas* says it is "simpler to call the pretty things Bluets." Well, perhaps it is "simpler," if any one by an exertion of will power refuses to learn or say *Houstonia*—but does the name identify the plant? In my experience I have found for one person who called the flower Bluets, half a dozen who called it Innocence; and, furthermore, have heard at least the names Spring Beauty, Day's Eye and Eyebright applied to this very plant in different localities. All three of the names last mentioned belong properly to other plants, so perhaps the illustration needs no further comment.

It seems to me the real question, therefore, is, whether it is better to use fixed Latin names or fixed common names in *lingua vernacula* for our plants. I do not think any reasonable person can for a moment doubt what the answer should be. The Latin scientific name is recognized the world over, the "common" name, as a rule, only in the sense of being local.

Now, if our children are to be taught the names of plants, is it common sense to teach them the name that is likely to be of the least use to them, in preference to a name that can always be accurately used the world over? Of course I admit that "no hard and fast line can be drawn between the two classes of names;" for every language will have its own popular names for plants, and may adapt the Latin names more or less to its own form. Such common names have their own value, and do not detract in any way from the argument.

I have said nothing as to the vexed subject of differences in scientific botanical nomenclature, and for obvious reasons cannot enter on it here. Some changes in scientific nomenclature are necessary for scientific accuracy, and to express the advances and readjustments of our best knowledge of systematic botany, while other changes are made, whether rightly or wrongly, for the purpose of establishing a uniform system of nomenclature. Whatever may be the views of particular botanists on these matters, the tendency is toward the greatest scientific accuracy of classification and the most uniform system of nomenclature—a tendency that no one can claim exists anywhere in the labors of those who tell us that the common names of plants are to be taught and used in preference to the Latin names that sooner or later every lover of flowers must adopt.

Boston.

Edward L. Rand.

Notes on a Few Plants in West Virginia.

To the Editor of GARDEN AND FOREST :

Sir.—The *Trilliums* (*T. grandiflorum* and *T. erectum*) in this region are especially luxuriant and abundant, and often afford specimens nearly twice the size of the common type. The last season I met with a clump of the white species, consisting of four stout stems, measuring twenty inches to two feet in height, and with leaves and flowers corresponding in size. Of the purple species, which is scarcely less common, the flowers will measure uniformly two inches and a half or three inches across, or nearly double that given by some botanists. Do not these facts suggest the capabilities of these beautiful plants, and the hope that a race might be secured larger and superior to any yet seen in cultivation?

The Pennsylvania *Anemone*, familiar to most observers, is another common plant in low, wet grounds, and of a specially vigorous growth. This, with its large white, waxy flowers, is always an attractive plant, but in many specimens as they grow here, and possibly elsewhere, although I have never seen attention called to it, the upper leaves (composing the involucre) are most beautifully margined with brown, which, if it could be reproduced in cultivation, as in the more distinctly marked specimens, would add much to its value as an ornamental plant.

Valeriana pauciflora, which Gray notes as rare or local, is here found in rather frequent, though always in restricted or sparse colonies. With the singularly long and slender tube of the pale purple corolla, and the rather odd-looking (pinnately divided) leaf by reason of the comparatively large terminal leaflet, this herb will claim the interest of most observers.

Another plant which both Gray and Wood note as rare, is here abundant, covering large areas in shaded ravines—namely, *Cedronella cordata*. In habit and appearance this is suggestive of the Ground Ivy (*Nepeta glechoma*), to which it is nearly related; it is, however, a handsomer species, with larger leaves and flowers, the latter being fully an inch long, and it would, doubtless, make a desirable plant for rock-work.

The Crimson Balm or Bergamot (*Monarda didyma*), sometimes cultivated and well known for the intense coloring of its flowers and as a fragrant Mint, botanists tell us is nowhere common or abundant. It is here one of the most familiar and characteristic of the summer wild flowers, growing in many damp, shaded grounds, and more conspicuously on the margins of small streams, often in patches of considerable extent. Occasionally flowers of the brightest and purest purple—even more pleasing and scarcely less striking—may be seen growing among the scarlet, both forms being well worthy of cultivation.

White forms of Spreading Phlox (*P. divaricata*) and Greek Valerian (*Polemonium reptans*) have here repeatedly come under my observation; also a white variety of *Lobelia syphilitica*. I have also noted specimens of the Virginia Lungwort (*Mertensia Virginica*), with the unfolded flower entirely pink or lilac, the type being pink in the bud and blue in the full flower. I have often met with specimens of *Rudbeckia hirta*, with their rays blotched with brown at their base, forming a distinct ring about the cone, adding much to the beauty of the flowers. These examples serve further to illustrate that

there are varieties or forms, as yet but little known, of many of our most familiar flowers, which possess, in a practical and æsthetic point of view, all the interest and value of an entirely new species, and which are well worthy of the attention of lovers and cultivators of wild flowers.

Fairview, Hancock Co., W. Va.

W. E. Hill.

A Chart of Standard Colors.

To the Editor of GARDEN AND FOREST:

Sir.—Mr. C. R. Orcutt (vol. ii., page 622) points out a want very much felt by every one having to describe flower colors. It is, however, a fact that, owing to a difference in the construction of the eye, certain colors have a different appearance to one or the other observer. It would be a great advantage to science in general to have such a standard chart. If it be undertaken, it ought to be compiled by a commission of scientific men, including some good authorities. The large work of the French chemist, Chevreuil, might form the basis to work upon. A few years ago there was also a very exhaustive article in the *Gardeners' Chronicle*, which would be valuable in that matter. It apparently came from a competent authority.

Baden-Baden.

Max Leichtlin.

To the Editor of GARDEN AND FOREST:

Sir.—Mr. C. R. Orcutt pleads (vol. ii., page 622) for a chart of standard colors. Such a chart is certainly a desideratum to all naturalists. But the difficulties in the way of its preparation and publication are very great, and I do not look for such a chart in many years, if ever.

In my own practice I use for this purpose an agent's sample-case of spool silks. The Brainerd & Armstrong Company, of New York, make a very neat and compact pocket sample-case which contains 220 named colors. This affords the best means which I have found of securing uniformity in observation and nomenclature between myself and assistants; and, in fact, it leaves little to be desired.

Ithaca, N. Y.

L. H. Bailey.

Easter Flowers.

To the Editor of GARDEN AND FOREST:

Sir.—The most beautiful display of Easter flowers made by any New York florist this year filled the windows of a large shop on Broadway between 27th and 28th Streets. On Thursday the principal window showed a line of potted Hyacinths, chiefly pink and lilac, set in a mass of Ferns. Behind these stood, in the centre, a large crimson Azalea with a Cytisus on either side, and beyond Roses, smaller plants of Cytisus and Lilies, all in baskets tied with ribbons of harmonizing colors. Back of this line were large Azaleas of paler pink varieties and a mass of Lilies and Bush Daisies, while lilac Cattleyas hung in baskets from the top of the window. The general effect was pink and white and green with dashes of yellow and lilac, and the window, as a whole, was both brilliant and harmonious. On Saturday the arrangement was somewhat changed; more white flowers, chiefly Lilies, being used with pink Hydrangeas, and more baskets of Orchids, some of them very beautifully grown and arranged. Inside the shop the most remarkable feature was *Lilium auratum*, in large numbers and excellently grown.

In other shop-windows less care had been paid to the arrangement of the plants. But I noted one place, temporarily hired by a florist of upper Sixth Avenue, where a very beautiful effect had been achieved in the interior. Rows of staging ran along the walls and down the centre of the long room, and supported, on the top shelves, files of large plants of Cytisus, making two little avenues of brilliant yellow, beneath which the other plants were grouped. There seemed few novelties among either potted plants or cut flowers. As was the case last year, many Orchids could be found; but the main reliance for plants was placed on Lilies, Hydrangeas, Spiræas, Cytisus, Bush Daisies and Azaleas, and for cut flowers, on Roses. The Hydrangeas were splendid, and the Azaleas, most often grown as standards with wide, round heads, had reached their highest point of perfection. Lilies were few and very inferior, and spring bulbs were not conspicuous, Daffodils being more plentiful than other sorts, but poor as contrasted with last year. The Lilies were fine, but universally marred by the loss of their anthers. Of course there is an excuse for this removal, but no one will deny that it greatly injures the beauty of the flowers, and to some persons it totally destroys their charm. Without the bright yellow sparks they seem flat, stale and unprofitable to the eye. There is no flower so much in demand as this for the adornment of churches. It is the accepted symbol of innocence and grace, and, moreover, has a peculiar consecration in

Catholic minds from its time-honored dedication to the Virgin. But to take off its anthers destroys its ecclesiastical signification for Catholics—though perhaps in this prosaic time and land they are not aware of the fact. They do not need to be told that the Lily is the Virgin's flower because "the pure white petals signify her spotless body and the golden anthers her soul sparkling with divine light"? However, if a Lily is purchased with some of its blossoms in bud, these at least will ultimately delight the possessor with both spotless petals and sparkling anthers.

New York florists complained that the damp, dark season had reduced their supply of flowers, but they must have done well with what they had from the empty look of their shops on Saturday night. Easter has, in fact, at least in this city, taken the place lately held by Christmas, and before that by New Year's Day, as the florist's busiest time. His trade then is largely with potted plants, of course; but gifts of cut flowers and even set pieces are now the rule, not the exception, and every parlor is abloom before the sun of Easter Sunday has set. Perhaps the profits of the Easter trade are not so great as those of the midwinter festival, but certainly its volume is getting to be surprisingly great.

New York.

S.

Recent Publications.

The Horticulturists' Rule Book. By L. H. Bailey. New York Garden Publishing Company.

This little compendium embraces in its 200 pages much information which a gardener needs in his daily practice, together with some statistics and miscellaneous matter, which are interesting enough but foreign to the purpose of a handbook of this character. The best part of the work will be found in the first four chapters, which treat of insects injurious to plants and plant diseases, with the approved remedies for each. In no department of horticulture has the advance in knowledge been so rapid as it has been in this particular field during recent years. Discoveries have followed each other in such quick succession that the fruit-grower or gardener who reads the current literature of his art is quite bewildered by the variety of treatment recommended to prevent or cure the injuries from insects and fungi. The sufferers from these enemies have reason to thank Professor Bailey for having brought within the compass of fifty pages all the well established facts on these subjects that will prove of immediate practical service to them. This digest of the results of so much study and experiment is well arranged and indexed so that any one of ordinary intelligence can inform himself as to the character and composition of all the most deadly insecticides and the safest and most effective way of applying them. And the same is true of the remedies and preventives of fungous diseases. In no other work with which we are acquainted can there be found so much information on these subjects, in a compact and accessible form, and embodying the most recent experience.

While this is the best feature of the book, there are many other collections of tables, rules, recipes and directions for practice which help to make it a singularly useful manual for convenient reference.

Recent Plant Portraits.

Botanical Magazine, March:

ZAMIA WALLISII, t. 7103; a short-stemmed or nearly aculeous species from Guatemala.

SATYRIUM MEMBRANACEUM, t. 7104; a beautiful terrestrial Orchid, with bright carmine flowers, deepening to crimson on the back of the lip, from the neighborhood of Port Elizabeth, in South Africa.

ARISEMA WRAYI, t. 7104; a native of the Malay Peninsula.

LATHRÆA CLANDESTINA, t. 7106; a beautiful parasite of southern Europe, now successfully cultivated at Kew, where, planted on the roots of a Willow, it has increased, and flowered profusely.

PAPAVER RUPIFRAGUM, var. ATLANTICUM, t. 7107; a native of the Great Atlas south of the City of Morocco, where it grows at an elevation of from 6,000 to 7,000 feet.

ALLIUM KANSUENSE, *Gartenflora*, March 1st.

ALLIUM CYANEUM, *Gartenflora*, March 1st.

BILBERGIA × PERRINGIANA (B. nutans × Liboniana), *Gartenflora*, March 15th.

EUPATORIUM PROBUM, *Gardeners' Chronicle*, March 15th; a soft-wooded greenhouse plant, a native of Chili, whence it was introduced into England several years ago by the late Mr. Wilson Saunders, although not previously described, as pointed out by Mr. N. E. Brown, who now gives characters for it.

Notes.

Our correspondent, Mr. Rolfe, the English authority on Orchids, has been appointed an assistant editor of *Lindenia*, the great *Iconographie des Orchidées*, now in course of publication in Belgium.

Part I. of the new volume of *Hooker's Icones Plantarum* (vol. xx.) is devoted to different plants, principally Stapelias belonging to *Asclepiadaceæ*, the descriptions being furnished by Mr. N. E. Brown, of the Kew Herbarium.

A great "flower festival," similar to the one which was so successful last year, is being organized in Detroit by the *Journal* of that city, and will open on the 22d of April. The proceeds will be divided between a number of local charities.

The Manchester *Guardian* states that Dr. Jones, of Acton Hall, has discovered a chemical process by which the juice of apples and grapes can be manufactured into an agreeable non-alcoholic beverage which will keep for a number of years without fermentation.

A bundle of California-grown Licorice-roots was lately sent to the office of the *Tulare Register*. The editor of that paper asserts that the roots have the genuine licorice flavor and sweetness and cannot be distinguished from the imported article, and that the plant grows like a weed.

Premiums to the amount of \$250 were offered by John Gardiner & Co., for the best collection of spring flowering bulbs to be competed for at the Exhibition of the Pennsylvania Horticultural Society. The first prize was won by William Jamison, and the second by J. W. Colflesh. A box of Crocuses shown by W. K. Harris received special mention.

Prunus Davidiana, and its variety with white flowers, attracted much attention from visitors to the *Jardin des Plantes* in early March, as did a fine specimen of *Parrotia Persica*, covered with blossoms. This tree, still little known outside of botanical gardens, belongs to the Hamamelis family. It is especially ornamental by reason of its foliage, which does not appear till later in the season. Its flowers, of which the most conspicuous parts are the brownish red stamens, have little value.

L'Orchidophile remarks upon the flowering in the collection of M. Finet, in Argenteuil, of a *Lalia pumila* with white flowers, a variety not previously described; while another journal, the *Lyon Horticole*, mentions the exhibition at a meeting of the *Association Horticole Lyonnaise* of a giant variety of *Lycaste Skinneri*. It is called by its owner, M. Comte, *L. Skinneri grandiflora*, and is said to be remarkable for the extraordinary size attained by its leaves and flowers, which surpass anything hitherto recorded of this very variable Orchid.

According to the *Manufacturers' Record* 542,145 gallons of so-called Olive-oil were sent from Italy to this country during the year which ended June 30th, 1889, but its purity may be estimated from the fact that, within the same period, we sent to Italy 65,250 gallons of Cotton-seed-oil. Since that time our exports of this product have greatly diminished, possibly because, since the discovery of a test for the purity of Olive-oil, the Italian authorities have been able to control somewhat its manufacture. This discovery was made not long ago by the celebrated chemist, Becchi, and his test is said to be entirely reliable.

From an instructive bulletin lately issued by Professor Whitcher, of the New Hampshire Experiment Station, it appears that the commercial fertilizers sold in that state do not contain enough potash for the requirements of the soil there. It also appears that home-mixed chemicals can take the place of barnyard-manure as a source of plant-food. For the state in question a fertilizer should contain from nine to eleven per cent. of phosphoric acid, from nine to fifteen per cent. of potash, and from two to four per cent. of nitrogen. The prepared fertilizers in the market average eleven per cent. of phosphoric acid, two and a half per cent. of potash, and two and a half per cent. of nitrogen.

The term "gun fences," used by Mr. A. D. Mellick, Jr., in his recently published book, "The Story of an Old Farm," has, doubtless, puzzled many of his readers. Replying to a question put by one of them in the *Evening Post*, he says that gun fences, as formerly used in New Jersey, were "constructed of rails, often formed of lopped tree-branches, resting one end on the ground and the other in the air at an angle of about forty-five degrees, each one being supported a little above the centre by small cross stakes shoved into the ground. They were popular with the early settlers, because of their being so

easily and rapidly built, owing to their needing neither post-holes nor hewn posts. At a distance the rails did not look unlike a lot of guns stacked in line, hence the name."

The second part of Mr. H. Nehrling's "North American Birds" has appeared. It contains the completion of the account of the Mocking Bird, and descriptions of the Cat-bird, the Brown Thrasher, the Long-billed Thrasher, the Curve-billed Thrasher, the Crested Thrasher, the American Dipper, the Bluebirds, and the beginning of the Gnat-catchers and Warblers (*Sylviidæ*). The work will be finished in twelve parts, illustrated by thirty-six colored plates from drawings by Ridgway, Goering and Muetzel. It is published by George Bramder, 286 West Water Street, Milwaukee. The first part has received the highest praise from naturalists competent to judge of its value, and its excellence is fully sustained in the number before us.

The first number of *Le Journal des Orchidées*, a bi-monthly devoted to the cultivation of Orchids, has reached us. This new journal, the editor, M. Lucien Linden (Secretary of the *Orchidéenne*, and editor of *Lindenia*, etc.), tells us, has no scientific pretensions, and no other ambition than to be practically useful in giving as much information as possible upon the care and cultivation of Orchids. *Le Journal des Orchidées* is published at Brussels and will appear on the 1st and 15th of each month. It is a handsomely printed octavo of sixteen pages, without illustrations; and the first number, which contains a number of good articles, fully justifies the claim of the editor. The subscription price is ten francs a year, which may be sent to the office of the journal, 100 Rue Belliard, Brussels.

A western perfumer advertises the "phenomenal sale" of a new extract which he calls "Golden Rod perfume." If it has no more odor than the blossoms which, as he says, have won popularity as our "national flower," any sale, however small, must indeed be regarded as phenomenal; nor does it seem probable that the single species of *Solidago* (*S. odorata*), the leaves of which emit, when crushed, an anisette-like perfume, can be obtained in sufficient quantities for extensive distillation. There is frequent similar proof, however, that in this, as in other trades, it is difficult to supply a succession of "novelties" and fit them with attractive names without trusting a little to the credulity of the public. For example: if the Golden-rod is popular, the Orchid is "fashionable," and this is even better for advertising purposes. Therefore "Orchid perfumes" are now in the market bearing the names of several kinds, some of which have no fragrance whatever. Sometimes the makers are so discreet as to say no more in their advertisements than that they "reproduce" the odor of the given flower; but the name on the bottle seems like an attempt to make the confiding purchaser believe that he can inhale from it the actual breath of some rare, costly exotic.

American pomology has lost an ardent devotee in the death of Mr. Charles Gibb, which occurred in Cairo, Egypt, on the 8th of March. Mr. Gibb was born in Montreal in 1845, was graduated from Gill University at the age of twenty. On account of impaired health he sought out-door occupation, and after a visit to Europe he spent some time with prominent horticulturists in New York and New Jersey, an experience which strengthened his taste for fruit-culture and led to his adoption of that pursuit. Fortunately he was possessed of ample means, and on his return to Canada he purchased a large tract of land at Abbotsford, Quebec, where he established trial grounds for exotic trees and shrubs and planted extensive orchards especially of the more desirable Russian fruits. In 1882 Mr. Gibb visited Russia in company with Professor Budd, and the work which they accomplished in introducing Russian fruits to notice is well known. In June of last year he left Montreal for a journey through the East in the interest of fruit-culture and had visited Japan, China and India and was on his way home when death overtook him in Egypt. Mr. Gibb was a man of modest and retiring disposition, but his home at Abbotsford was the seat of wide and generous hospitality to all those who were interested in horticultural pursuits. He was singularly unselfish, and the horticultural and kindred societies of the Dominion, in all of which he took an active interest, bear witness to his public spirit. He prepared numerous papers which have been published during the last fifteen years in the reports of the Montreal Horticultural Society, the Ontario Fruit-Growers' Association, the American Pomological Society and similar organizations, most of which are of permanent value, especially those which relate to the fruit-trees of northern Europe, their nomenclature and their value for cultivation in the orchards of this continent.

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Planting New Places.

THIS is the season when novices in planting, especially those who have recently acquired possession of suburban or country homes, are preparing to stock their grounds with ornamental trees and shrubs. The thought that thousands of new gardens are to be made would be a pleasant one, indeed, if there were any assurance that they would be well planned and planted; but the probabilities are that ninety-five out of every hundred of them will have no plan whatever, while the great majority of the trees and shrubs used in them will be selected without any adequate reason, and then badly planted in improper positions. This is a perfectly true statement and on its face it is discouraging enough. But the fact is that failure is the foundation of nearly all practical knowledge of gardening among amateurs, and the mistakes of this year will be an education for the next. When once a man or a woman either sets out in serious earnest to beautify the home-acre by planting trees and shrubs and flowering herbs, we may cherish a well-grounded hope that this is the beginning of an interest in gardening which will deepen with ensuing years and come to be at last an unfailing source of recreation and refreshment.

And yet if novices in the art of gardening would seek a little counsel at the outset and act upon it, their education would be much more rapid and much less expensive. They almost invariably begin at the wrong end, and gather their materials together first and then wander around their grounds in search of places to put them. The catalogues of the nurserymen offer to such persons a fascinating field of study. Naturally enough in these trade-lists plants of established merit are passed over with slight mention, for it is justly assumed that most buyers are informed as to their value. It is not surprising, therefore, that the novice, misled by the more circumstantial and perhaps a trifle over-colored description of the novelties and rarities and oddities among trees and shrubs, makes his selection largely from this class. The probabilities are that he will buy a great many more than are needed, and after he has

crowded them all into his place, he will begin to realize that it has no consistent purpose, no unity of expression, no meaning.

It is not probable that any marked success would have been achieved, but certainly the outcome would not have been so utterly unsatisfying, if a careful plan of the grounds had first been made. Let the amateur planter at the very outset make an accurate diagram of his grounds, drawn to a certain scale, so that he can note the space covered by any given tree or shrub. Next let him attempt to form in his mind a clear and definite picture of his future home-scene—such a picture as he will be able to construct with the verdurous material at his command—grass, shrubs, trees, flowers and festooning vines. No tree or shrub will then be selected merely because it is pretty, but because it fits in with the rest to give outward and visible expression to his thought. To accomplish this the mental picture will need to be distinct and vivid. It must embrace the relation of the house to the grounds. It should preserve and frame in any attractive prospects beyond the boundaries of the place, and shut out of view what is unsightly or incongruous. It must provide for walks and out-buildings and a hundred conveniences for the household in such a way that they will not disturb the harmony and fair proportions of his picture. When such a design is perfected it will not be difficult to make an order for the nursery, for it will be known exactly how many trees and shrubs are needed, and an intelligent reason can be given why each particular one was selected for its chosen position.

But is it probable that the beginner will be able to make a design which shall be so reasonable, consistent and complete? Perhaps not. But an honest attempt to make one, for which he can give an intelligent explanation, will be a pretty good way to convince him of the genuine difficulties of the situation. One part of an education consists in finding out how much there is to learn; and the novice may discover, before his design is finished, that it requires real artistic feeling and training to make a perfect cabinet-picture on a half acre of ground, as truly as it does to plan a park. He will realize that there are adaptations and adjustments to be settled in the very framework of his design and all through its essential elements which demand experience and thought. He will more than suspect that he has made a mistake in attempting to solve, off-hand and while the buds are bursting, problems of such puzzling complexity that an artist with years of practice behind him would hesitate to undertake them without ample time for study. He may divine at last that even a work of this magnitude may present an opportunity for displaying a comprehensiveness of treatment, a refinement and felicity of touch which will worthily exemplify the supremacy of the hand of genius.

One who has been educated up to this point will begin to look about him for a landscape-gardener of recognized attainment, and, more than that, he will be prepared to appreciate his counsel and to follow his instructions with confidence.

THE popular interest in Arbor Day is steadily increasing if it is measured with any accuracy by the growing volume of literature on the subject. We have just received the "Arbor Day Manual," which is a stout octavo of 450 pages, and handsomely illustrated. It has been prepared by Mr. Charles R. Skinner, Deputy Superintendent of Public Schools for the State of New York, and it contains selections in poetry and prose on subjects relating to forests, trees, shrubs and flowers, together with songs set to appropriate music, and its declared purpose is to aid teachers in arranging programmes for the celebration of the festival. This is the most elaborate treatise we have seen, but in some other states the manuals are nearly as large, while in many others a modest pamphlet prepared by some public officer is deemed sufficient. In Colorado, for example, the Forest Commissioner, Mr. Edgar T. Ensign, has issued a circular

which confines itself to some practical suggestions relating to the transplanting and culture of trees, and excellent suggestions they are. Mr. Ensign tells those who are interested in the day what kinds of trees should be chosen for the different portions of the state, how they should be arranged on school-grounds for the best effect, how the transplanting should be done and how the trees should be cared for afterward.

Of course, the sentimental side of the celebration has its uses, and the cultivation of an affection for trees and of an appreciation of their beauty is an object worth striving for. But the love for trees will be no less when it is associated with a knowledge of what they require for wholesome growth. Arbor Day will prove most beneficial in those places where the trees are not forgotten as soon as the songs have been sung and the poetry recited. If the memorial trees have been properly selected and planted, the teacher will help to encourage a genuine regard for them if he explains to the young persons in his charge why the ground about them should be kept free from grass, why it is beneficial to stir the surface occasionally or to mulch it well. If it appears on the next annual recurrence of this festival that the trees planted this year have been neglected, robbed of food and moisture by grass and weeds, loosened by the wind, preyed upon by borers or other insects, this will prove that the celebration has been a mockery, and all the feasting and oratory and music wasted on a sham.

Notes on North American Trees. XVI.—A Question of Nomenclature.

A WIDELY distributed *Xanthoxylum* of tropical America, with a geographical range from Florida to Peru, was described by Linnæus in the "Species Plantarum," published in 1753, as *Schinus Fagara*. A few years later he recognized the fact that his genus *Schinus* could not contain this plant, which he named in the "Amœnitates" (v. 393), published in 1760, *Fagara Pterota*. The next botanist to impose a name upon the plant was Patrick Browne, who called it *Pterota subspinoso*, in his "Natural History of Jamaica," published in 1789. Willdenow, in his enumeration of the plants cultivated in the Berlin garden, published in 1809, gave it a new name, *Fagara lentiscifolia*, citing a manuscript name of Humboldt and Bonpland. Finally, Kunth recognized that this plant might be referred to the Linnæan genus *Xanthoxylum*, and published in 1823 in the "Nova Genera and Species" of Humboldt, Bonpland and Kunth (vi. 3), *Xanthoxylum Pterota*; but in referring this plant to *Xanthoxylum*, Kunth passed by the earliest specific name, *Fagara*, which had also been used as the generic name of the plant by Linnæus and by Willdenow, and took up the later name, *Pterota*.

Under the principle that the earliest Linnæan specific name should, when not preoccupied, be adopted as the specific name of a plant, which I have followed in the "Silva of North America," this plant, which is one of the commonest of the small trees of south Florida, and widely distributed through western Texas, should be known as *Xanthoxylum Fagara*.

This name of *Fagara*, as applied to our plant, is due, too, to a misunderstanding. The name *Fagara*, according to Avicenna, the famous Arabian physician, was in use among the early Arabians to designate an aromatic plant of which the name is now lost. It was afterward taken up by Clusius and the early European apothecaries, who designated, under the name of *Fagaræ majores*, the aromatic fruit of some eastern tree which is supposed to be the *Xanthoxylum Rhetsa* DC of India. Linnæus, in his "Materia Medica," published in 1749, where he first mentions our plant, appears to have supposed that it was the origin of the *Fagaræ* of commerce, and so used later, in the "Species Plantarum," the old Arabian *Fagara* as its specific name.

C. S. Sargent.

The Art of Gardening—An Historical Sketch.

XIX.—The Arabs in Spain.

IN no land did the Arabs (or the Moors, as we more often call them in this connection) rise to so great a height of wealth, cultivation and luxury as in Spain. "No nation," says Draper,* "has ever excelled the Spanish Arabs in the beauty and costliness of their pleasure-gardens. Retaining the love of their ancestors for the cooling effect of water in a hot climate, they spared no pains in the superfluity of fountains, hydraulic works and artificial lakes. . . . There were also menageries of foreign animals and aviaries of rare birds. . . . Among flowering shrubs there were winding walks, seats cut out of the rock, and crypt-like grottoes hewn in the living stone. . . . Not only did the artist try to please the eye. . . . He also boasted of success in the gratification of the sense of smell by the studied succession of perfumes from beds of flowers." A recent writer,† speaking of the southern part of the peninsula, says that its gardens are survivals of the Moorish ideal of what a garden should be, modified by the requirements of country and climate. This ideal, in the hot, arid lands of the Arab's nativity, meant as much shade and coolness and moisture as could be obtained—thick bowers and vistas of foliage, plashing fountains, trickling rills and "creeping Roses and Jasmine to beget the perfume that his soul loves." In Spain so much shade was not needed and the gardens were made more open, yet shadowy foliage greatly predominated over sunlit spaces. Even in the days of the Renaissance, after the Moors had been expelled, many garden arrangements were but repetitions of their own, as, for instance, the very elaborate arabesques in oriental patterns which appear on a magnificent scale in the gardens of the Escorial, wrought with low clipped hedges of Box. "Another survival of Moorish times is the wall running by the garden-paths, hand-high, faced with painted tiles (*azulejos*), along whose top is scooped a deep furrow filled with garden-earth, and planted mostly with Carnations, Pinks and Gilliflowers, or the dwarf, sweet-scented Iris of Portugal. All these plants love the drought; and so set their flowers can be plucked or smelled without bending the back—an ingenious device of the ease-loving Oriental." Clipped hedges were frequently used by the Moors; but we read of no fantastically artificial shapes such as those that were beloved in ancient Rome and throughout Europe in the seventeenth century.

Every Moorish house had its court-yard, the original of the *patio* which is ubiquitous to-day in Spain. It was floored with stone or mosaics, openings being left for planting a few large trees. Smaller trees and shrubs stood about in pots with bright flowers growing around their roots. The walls were formed of simple loggias or fantastically rich arcades, according to the wealth of the proprietor, and arbors were constructed with vines upon a net-work of wire. A running spring occupied the centre, or, if water-power was available, a fountain took the place of the spring, and little holes were pierced in the pavement through which rose miniature jets. If a garden was connected with the house, it was regularly disposed with a multitude of canals and basins, broad, shadowy roads, and narrower paths overarched with flowers, trained on colored or gilded wire, leading to more open spaces where pattern-beds were planted with bright-hued flowers or arabesqued in Box. *Patios* were attached to the mosques as well as the houses, and an old Moorish example may still be seen near the cathedral of Seville.

The Moorish palace-garden was sometimes wholly formal in arrangement. The gardens of the Alcazar, near Seville, for instance, although greatly altered during Renaissance years, still preserve enough of their original character to be recognized as of Moorish origin, and they consist of numerous great square court-yards, divided from each other by walls and colonnades, like a succession of large *patios*.‡ But in other places we find royal gardens of a very different character, yet equally typical of Saracenic art—gardens which prove, indeed, that the charms of picturesqueness, mystery and variety were appreciated as well as those of balance and architectonic grandeur. The bold, varied character of the landscape in many parts of Spain, and its richness in contrasts between temperate and semi-tropical forms of vegetation, inspired the Spanish Arab to develop to the full that instinct for the wild, or seemingly wild, in gardening art, signs of which had already been displayed in Persia. Nothing could be less like the

* "Intellectual Development of Europe."

† Oswald Crawford, "Summer-time in Rural Portugal," *Fortnightly Review*, June, 1888.

‡ Jaeger: "Gartenkunst und Gaerten."

formality of his *patios* and smaller gardens than the outer pleasure-grounds of the Alhambra and the Generalif near Granada.

Granada lies in a ravine cut by the River Darro, and extends out into the plain at the foot of the Sierra Nevada. The Alhambra rears its rosy towers from one of the mountain spurs, and the road that approaches it winds up from the city gate by a steep picturesque ascent to the main gateway of the palace. Théophile Gautier* describes this road as cut through a lofty forest and bordered by rivulets curling close to the roots of the trees, while from every crevice in natural rock or artificial wall gushes a bubbling spring; and a more recent writer† speaks in similar words of the constant yet irregular way in which water is everywhere introduced—tiny water-falls shoot out unexpectedly from the sides of the cliff, “suddenly to disappear into a yawning underground conduit. All this work,” he adds, “is entirely artificial, but is so completely in accord with its surroundings, so thoroughly artistic in thought, that it possesses the unstudied charm of nature’s best examples. Altogether, the outer gardens of the Alhambra are as delightfully planned as entrances to a realm of fairy-land as could be imagined. The Moorish landscape-work and the picturesque mysteries of the palace are revealed little by little. There is no general vista, no all-embracing view, but the imagination is left to picture what is dimly revealed through the fountains and across the fountains and under the wide arches, while, as in all Moorish work, the attention is held by half-disclosed attractions. This is the keynote of the whole arrangement—to awaken interest by unexpected surprises and half-concealed vistas.” Naturally, the aspect of this approach to the Alhambra must be much wilder to-day than when it was laid out in the thirteenth century. Yet the landscape-gardener builds, not for the hour, but for futurity; and the fact that his conception has here retained its charm while the passage of centuries has accented his first idea, is proof of consummate skill in the “art which conceals art.”

From this picturesque approach the Alhambra enclosure is entered through a great gateway, in the thickness of which the path makes two sharp turns, emerging as a steep roadway flanked by high walls that conceal everything but the “Vermilion Towers” of the palace at the top. It ends on a broad, flat, open terrace (once very extensive, but now partly covered by a huge Renaissance palace built by Charles V.), which affords a magnificent view over the ravine below and the course of the Darro. The original design of the gardens which spread before the palace cannot be deciphered, but, says Mr. Blackall, “the large terrace, with quiet, shady avenues leading from it, was probably then, as now, the central feature of the scheme.” The palace itself is so largely composed of a multitude of *patios*, filled with fountains and water-works of every kind, that, in Gautier’s words, it seems, “like many other Moorish habitations, merely a big, decorated fountain.”

New York.

M. G. Van Rensselaer.

Plant Notes.

Two American Honeysuckles.

THERE has always been a great deal of confusion in gardens with regard to the identity of two climbing Honeysuckles of the Eastern States which are sometimes cultivated—*Lonicera flava* and *Lonicera Sullivanii*; and it is only in recent years that botanists have comprehended the differences which distinguish these plants and their geographical distribution. The figures, therefore, of the two species, which appear on pages 190 and 191 of this issue, will serve, perhaps, to facilitate their identification.

Lonicera flava is an old inhabitant of gardens. The earliest mention of this plant was published in 1802 in Drayton’s “Views of South Carolina,” where it was described as growing on Paris Mountain, a low, isolated elevation near Greenville, in that state. John Fraser, a Scotch botanical traveler and collector, visited this place afterward and sent or carried plants to England in 1810. No other botanist, so far as is known, has ever been on Paris Mountain, and *Lonicera flava*, although it has been reported as growing in upper Georgia, is only known now by the descendants of Fraser’s plants, which have been kept in gardens, where, however, they are too rarely seen and are too little known;

while wild specimens are one of the chief desiderata in herbaria of American plants.

Lonicera flava (Fig. 33) has twining stems growing to a height of ten or twelve feet, broadly oval leaves, the two or three upper pairs connate into a broad disk, and, like the stems, quite glabrous. The flowers, produced in short, simple, terminal clusters, open here in June. The corolla is bright orange-yellow, the slender tube longer than the limb and hirsute-pubescent on the upper part of the interior. The filaments and style are glabrous. The bright scarlet fruit is ovate and contracted at the apex into a short point.

Lonicera Sullivanii (Fig. 34) was first noticed more than fifty years ago by Mr. W. S. Sullivan, who found it in Ohio, and who suggested doubtfully in his “Catalogue of the Plants of Columbus” that it was an undescribed plant. It was confounded, however, with *Lonicera flava* as a variety in Torrey and Gray’s “Flora of North America,” and in all the editions of Gray’s “Manual” except the last. Mr. Sullivan at the time of his discovery sent plants to the botanic garden of Harvard College, where it was propagated and quite generally distributed, but always under the name of *Lonicera flava*, and it is still almost always mistaken for that plant, which is extremely rare in gardens, being found now, so far as I have noticed, only in the garden of the Paris Museum and at Cambridge and in the Arboretum here; while *Lonicera Sullivanii* is not a rare plant in cultivation in eastern New England, where its large glaucous foliage is a familiar object in many country gardens.

Lonicera Sullivanii has feebly twining or sarmentose stems, rarely more than four or five feet long; and oval and obovate-oblong, thick, leathery leaves; those on the flowering stems are sessile and generally connate, the uppermost forming an orbicular disk. They become whitened, as do the stems, late in the season with a glaucous bloom, which makes this plant conspicuous and its recognition easy. The flowers are borne in elongated, loose, whorled clusters, often with a cluster in the axils of the second pair of leaves, and appear here at the same time as those of *L. flava*; they may be distinguished from the flowers of that species by their shorter corolla-tube, which is distinctly swollen or gibbous near the base, a little longer than the limb, pale yellow, marked with purple on the side exposed to the light. It is glabrous on the outer surface, and the filaments are glabrous or nearly so. The fruit is rather larger than that of *L. flava* and is nearly globular.

Lonicera Sullivanii is rather a widely distributed species, being found from central Ohio to Illinois, Wisconsin and the shores of Lake Winnipeg, and southward to central Tennessee. It has probably not extended much outside of New England as a cultivated plant; and if it exists in European gardens at all, it will probably be found under the name of *L. flava*.

These two species are handsome garden plants, especially *L. flava*. They are perfectly hardy and well worth cultivating, although their flowers are less fragrant than those of the English Woodbine (*L. Caprifolium*) or than those of the Japanese Honeysuckle. C. S. S.

Foreign Correspondence.

London Letter.

SOME plants of exceptional interest were exhibited at the meeting of the London Horticultural Society held at Westminster on March 25th. The Orchids call for attention first. A hybrid raised from *Cattleya Mossiae* and *Lalia cinnabarina* was an object of special interest, both to botanists and horticulturists. It was labeled *Lalia-Cattleya hippolyta*. It has a slender pseudo-bulb four inches long, a leaf six inches long by one and a quarter inches in breadth, and a flower five inches in diameter, spreading as in *L. cinnabarina*, the sepals half an inch and the petals an inch wide, the labellum two inches long, narrow, tubular, crisped and wavy in front. Its color is a uniform tawny yellow of a pleasing shade. It was

* “Voyage en Espagne.”

† C. H. Blackhall, GARDEN AND FOREST, I., 255.

exhibited by Messrs. James Veitch & Sons, who raised it. The only other hybrid raised in gardens, and of which *L. cinabarinum* is one of the parents, is *L. flammea*, a plant of somewhat similar character to the new one. *Dendrobium Wardianum*, Schroeder's variety, was remarkable for its large flowers and their deep color, the sepals being wholly rich amethyst, with a margin of white; the petals white, tipped with amethyst, as also was the lip. *Cattleya Trianae Schroederi alba* is a white flowered fragrant variety of exquisite form and large in size; the lip is blotched with pale yellow. *Odontoglossum Leeanum* was represented by a large specimen bearing a stout, many-flowered spike. This is one of the best of the many forms of *O. odoratum*, its flowers being unusually large, bright and clear in colors, and prettily marked on the lip. *O. Sanderianum*, *O. Hebraicum* and *O. gloriosum* are its near allies. *Dendrobium nobile nobilius* was in its best form, a most gorgeous flower, with petals an inch broad and colored the richest glowing amethyst. Many plants which are called by this name have small claim to it. *Phajus Cooksoni* was again shown, its flowers this time showing a distinct yellow color on the under portion of the lip. *Angracum sesquipedale* was shown with gigantic flowers fully nine inches across the segments, the spur measuring thirteen inches in length. *A. citratum giganteum*, a most elegant plant, bearing four spikes, each fifteen inches long, and the individual flowers an inch in diameter, or almost twice as large as the type. This is one of the most charming of the *Angracums*. *Calogyne Cummingsii* is a rare species seldom seen in flower; it has erect scapes with medium sized white flowers, the deeply fringed crest colored yellow and brown. *C. pandurata*, the giant of the genus and a most remarkable Orchid in respect of color. Its flowers, which are fragrant, measure four inches across, and are borne about a dozen together on a stout, erect spike (Lindley says pendent), are colored pale pea-green, except the lip, which is yellowish green, warted and marked with large irregular blotches and veins of ink-like black. *Cyrtopodium Legerianum* was represented by two huge specimens bearing immense spikes, or rather sheaves, of yellow and brown flowers. Mr. Cummings, who grew these specimens, informed me that he has flowered them now three years in succession by growing them in pots partly submerged in a water-tank and feeding them liberally with Clay's manure all summer. During the winter they are placed in a vinery and kept dry. A wonderful example of *Oncidium sarcodes* bearing two spikes about eight feet long with many branches and crowded with flowers, revealed capabilities in this species not previously suspected. Spikes two feet in length have been considered good for this *Oncidium*.

Other noteworthy exhibits were *Epiphyllum Gartneri*, a beautiful and distinct Cactus of great promise as a garden plant. *Hamantus multiflorus*, a tropical African species and one of the best of the genus as a stove-flowering plant; its scape, which precedes the leaves, is a foot high, and bears a globose head, nine inches through, of rich crimson flowers, which remain fresh a fortnight or more.

Cannell showed stands of his marvelous Pelargoniums and double Cinerarias. B. S. Williams sent a collection of *Clivias* of the best kinds. By the way, the writer of the note in GARDEN AND FOREST on *Clivias* was in error in stating that many hybrids had been raised from the species of this genus. As a matter of fact, there is only one hybrid, *C. cyrtanthiflora*, raised by Van Houtte about fifteen years ago from *C. miniata* and *C. nobilis*. The many named garden forms of *Clivia* are all seedling sports of *C. miniata*. A new and enlarged form of Lily-of-the-Valley was shown, its spikes a foot in length, and crowded with bells of large, well shaped flowers, the leaves also being unusually large.

Kew.

W. Watson.

The Veitchian Nurseries.

CHELSEA, a suburb of London bordering the Thames on the Middlesex side, has always possessed famous gardens. The Botanic Garden of the Apothecaries' Society was founded here more than two hundred years ago, and for about a century and a half occupied as prominent a position in botany and horticulture as Kew does now. Ranelagh and Cremorne, the two favorite pleasure resorts of the wealthy of the last century, flourished here, Chelsea then being "a pretty village, two miles from London." It is very different now. The Botanic, or "Physic," garden remains, a withered cripple of its former self; the builder has long since taken possession of Ranelagh and Cremorne, and instead of being a pretty village, Chelsea is an enormous workshop, with a population considerably over a quarter of a million. Its famous gardens of the present time are nurseries, and the most famous, not

only here but in the whole world, is the Royal Exotic Nursery of Messrs. James Veitch & Sons. Some account of an establishment which for over half a century has exercised a very great influence on the development of English horticulture, and has a staff of over 400 employees, will probably interest American readers.

It is customary to speak of the nurseryman as a mere tradesman, whose sole object is to make money out of horticulture. This may be true of the majority, but there are and always have been in England nurserymen who have taken a leading part in all movements for the advancement of horticulture from pure love of the work. By forming magnificent collections of plants of all kinds, both ornamental and useful, and by showing that they may be successfully and easily grown in a garden, these nurserymen have contributed more, perhaps, than any other body of men or institution to foster a love of horticulture among the people of this country. The names of Switzer, Lee, Abercrombie, Loddiges, Backhouse, Rivers and Veitch will always be placed amongst those to whom horticulture owes most.

The Royal Exotic Nursery, Chelsea, was established in 1814 by Knight & Perry. From its commencement it has held a foremost rank amongst the nurseries devoted to the introduction and cultivation of new plants. In 1853 an advertisement in the *Gardeners' Chronicle* announced that this nursery had become the property of James Veitch & Sons, of Exeter. The nursery at Exeter was conducted by the father and grandfather of James Veitch, and it had been for many years one of the principal nurseries in England in the days when Loddiges, at Hackney, and Rollison, at Tooting, were in full swing. The young James Veitch was apprenticed to Rollison, with whom he acquired that taste for and love of exotic plants, and especially of Orchids, which was of so much service to him at Chelsea.

It appears that the grandson was the sole owner of the newly acquired Chelsea nursery, the partnership with his father being only in regard to new plants which they conjointly introduced and shared. Collectors were despatched to America and the East, amongst them being the brothers Lobb, Pearce, Hutton, and Mr. Veitch's son, John Gould, who went to Japan and the South Pacific. The many beautiful and interesting plants that were thus obtained enriched horticulture as it had never been enriched before, with all kinds of conifers, including the Sequoia, Acers, Orchids, Nepenthes, Begonias, Liliiums, *Berberis Darwinii* and others.

In 1869 James Veitch died, the connection with Exeter was severed, and the management of the business devolved on the three sons, Harry J., John Gould and Arthur. The father was a man of remarkable energy, clear-headed, a most skillful cultivator and a true son of Adam. It was said of him that "a quick temper and impatience of opposition were natural adjuncts to a character such as his; but at the same time there was thorough conscientiousness and straightforwardness, a disgust for all semblance even of meanness or underhandedness." In the following year John Gould died at the age of thirty-one, and in 1880 Arthur also died, leaving the business to be managed by Mr. H. J. Veitch. Two of his nephews have lately joined him in the management. The development of the nursery and the amount of important work done in connection with it during the last ten years have been most remarkable. In the introduction of new plants; in cross-breeding Orchids, Rhododendrons, Begonias, Hippeastrums, hardy flowers and vegetables and in the superior cultivation of almost every class of plant, Messrs. Veitch occupy the premier position among English nurserymen. Besides all this, the publication of their most useful "Manual of Coniferæ" in 1881, of the classical and scientific "Orchid Manual" now in course of publication; the numerous papers prepared for the Linnæan and Royal Horticultural Societies, are evidences of a zeal in the cause of horticulture, a desire to help forward the science and the art, of more than an ordinary kind. Messrs. Veitch may be "making a fat thing" of their nursery work, but they are also doing a great deal more than most people to make gardening easy and delightful as well as remunerative.

The Chelsea nursery is only five and a half acres in extent, but it is almost wholly covered by 110 glass houses, many of them large. The entrance is through a long, lofty glass corridor banked with Ferns, Palms and other foliage plants, the whole of the roof being covered with red and white Lapagerias. On the right is the suite of offices, where a staff of twenty clerks is employed. On the left of the corridor are the large seed and bulb warehouses, an enormous business being done in this department. The corridor is terminated by a high house in which a collection of Tree Ferns, Cycads and large Palms are kept. From this the visitor may turn to the left and walk

through house after house filled with *Araucaria excelsa* (here first propagated with success by the late Mr. Court, one of the cleverest propagators we have ever had), Ferns of every sort, large Todeas and other filmy fronded kinds; big and little Adeantums, Davallias, Aspleniums, and in smaller houses all sorts of secrets in the shape of new kinds, which one may look at but not write about. Then we pass into a house or rather a pretty rockery covered with Ferns and protected by a glass roof. This house, delightful as a grotto in summer, is a kind of anteroom to the Orchid-houses. There are twenty-five of these, every one crammed full of plants, big specimens, pigmies, rare hybrids, new introductions, popular favorites, all elbowing each other and fat with health and happiness. Two houses filled with specimen *Cypripediums*, another with *Vandas* and *Aerides*, another with *Phalaenopses* and so on. The *Odontoglossums* make a brave show just now and amongst them are many gems of the cool house; *Sophranites* forming brilliant patches of scarlet; *Odontoglossum Humeanum*, *O. Edwardii*, *O. nebulosum* and *Oncidium Phalaenopsis* being conspicuous among the rest. The *Cattleya*-house, 132 feet long, twenty-two feet wide and fourteen feet high, contains thousands upon thousands of plants, some large specimens a yard across, others quite small, but all full of plump flower-sheaths of great promise for the blaze they always make in May and June. There are sixteen rows of four-inch pipes in this house, which is heated by an eight-foot *Trentham* boiler. Two broad lean-to houses have their roofs swarming with all sorts of *Dendrobiums* in baskets; and now we are in the show house for Orchids. It is about thirty feet square and twelve feet high, without any staging, the sides being built up of cork and stone and the middle occupied by a large irregular mass of the same material surrounding a cascade and tank. Pockets are cunningly made for the reception of the pots containing the plants, the cork and stone is more or less clothed with creeping *Ficus*, *Selaginella* and similar plants. The effect is particularly natural in appearance and pleasing. At the time of my visit the plants in flower in this house were *Epidendrums* of various kinds: *Calogyne Massangeana*, *Cymbidium Lowianum* and *C. Devonianum*, a white *Lycaste* with gigantic flowers seven inches across; *L. fulvescens*, with forty of its large, tawny, yellow flowers; *Phajus tuberosus*, *Dendrobium Cambridgeanum*, *D. Wardianum*, *D. Farmeri*, the white *Calogyne cristata* and many others. The *Nepenthes*-house is fifty feet long and contains a magnificent display of pitchers, Messrs. Veitch having been exceptionally successful in the cultivation of these plants from the first. *N. Rajah*, *N. Dicksoniana*, *N. Mastersii*, *N. Morganii* were in glorious form. Then we enter a house filled with *Anthurium Scherzerianum*, grand examples of good cultivation. A similar house is filled with *Clivias* in flower. The specimen greenhouse *Rhododendrons* fill three houses, whilst in smaller and propagating houses there are hundreds of thousands of these plants, from the tiny seedlings just hatched to the latest flowered of the new hybrids. The first hybrids were raised at Exeter some thirty-five years ago, but the best of those now known have been obtained since 1877.

In the houses devoted to new plants there are numerous new introductions from all parts of the world undergoing operations by Mr. Heale, the clever propagator and hybridizer, but of these I must not now write. *Lapageria alba* has a house to itself. Numerous specimens are planted in a peat bed twenty-five by ten feet. The shoots of this are led by strings up to the roof. These when ripe will be laid flat on the soil and covered with an inch or so of sandy peat. The result will be that hundreds of shoots will be pushed up, and these when rooted will be lifted and potted separately. By this ingenious method of layering an abundant stock of this popular greenhouse climber is obtained.

Another propagating house is filled with seedlings of all kinds: *Clivias*, *Streptocarpus*, *Begonias*, *Cacti*, *Rhododendrons*, including those wonderful Yunnan species, the introduction of which, unless report and dried specimens speak falsely, is an event of more than ordinary importance.

Hippeastrums fill a house sixty-five by eighteen feet, and the two thousand spikes they now bear present a wondrous array of brilliant colors and huge flowers. The popularity of these plants is shown by the enormous number sold from this nursery alone, which is something like two thousand every year. A hundred of Messrs. Veitch's seedling *Hippeastrums* have been certificated. Seedlings flower at the age of three years, and probably remain healthy till they are ten years old.

A pretty conservatory always filled with the flowers of the season is useful as a kind of sample-room. Parallel with it is a group of ten houses placed side by side; opposite to them,

on the other side of the central path, being a similar group. Ten of these long, low houses are filled with healthy young stock of hard wooded plants, such as *Boronias*, *Aphelaxis*, *Eriostemons*, *Ericas*, *Correas*, *Pimelias*, *Epacris*; Climbers of all kinds; young *Azaleas*, and so on. It is a long business to "do" the whole of these houses, interesting though the contents of every one undoubtedly are. The other ten of these useful structures contain stove plants of all kinds. A Palm-house crammed with large specimen *Kentias*, *Cocoses* and other decorative kinds; then follow three large houses of *Camellias*; another is filled with specimen *Aralias*; five others are devoted to the growing of pot-vines, of which Messrs. Veitch grow 4,500 every year, and even these do not supply the demand. A corridor leading to the high road contains magnificent specimens of *Camellia*, all in flower. The propagating houses teem with myriads of baby plants of every kind. New *Nepenthes* are here cared for and multiplied. Here, too, are young plants of the interesting *Heliamphora nutans*, cousin to the *Sarracenia*, and till lately shut up on the top of the *Roraima* Mountain.

About a dozen long houses contain soft-wooded plants, such as *Bouvardias*, *Pelargoniums*, *Fuchsias*, *Cyclamens*, *Carnations*, etc. Then there are frames innumerable, beds filled with *Carnations*, which grow well at Chelsea in spite of the poison of its fogs and smoke. The keep of this nursery is most admirable. "A place for everything and everything in its place" is the motto here.

I have omitted to mention the breeding houses for Orchids so ably presided over by Mr. Seden, because they, or rather their contents, have been taken to a branch nursery at Slough, near Windsor. Messrs. Veitch have also branch nurseries at Fulham, at Chiswick and at Coombe. These, however, can be dealt with in another letter. It is needless to say that Americans interested in horticulture are always welcomed at the Veitchian nurseries, where they can see as much perhaps in a short time of exotic garden-plants as anywhere in the world.

London.

Visitor.

Cultural Department.

Some Adaptations in the Strawberry.

THE Rose family has shown remarkable power to keep pace with the human family, and its adaptability to our needs and moods is one of its peculiarities, especially in the case of the small-fruits. The Strawberry has of late done a good deal in the way of adjusting itself to cultivation. Two years ago I received some plants of the *Haverlands*, and was astounded to find the roots a foot long in some cases. One trouble with our Strawberry-beds has always been a tendency to heave out with frost. But it seems now very probable that we shall develop plants with such a strong hold on the soil that heaving will be rare. It occurred to me that these *Haverlands* had put all their energy to roots and would show poor fruiting power; but experiment proved that the contrary was true: the plants were very prolific bearers of very large berries of excellent quality. Since receiving the *Haverland* I have found that several more of the newer sorts are developing the same tendency to extraordinarily long roots: *Viola* and *Crawford* are two fair samples of root evolution. *Tippecanoe* is said to have extremely long and massy roots, but I have not yet tried it. Clearly, it is along the line of root improvement that selection should take place as well as along the line of fruit enlargement. But the development of large fruit is, of course, what catches the popular eye and meets the consumer's desire. Those of us who remember the introduction of the *Wilson* and *Hovey* have in mind a remarkable history. We have gone on from the field berry until now a well cultivated bed of *Sharpless*, *Bubach*, *Summit*, *Ontario*, *Haverland* or *Crawfords* will give us thirty to a quart. So far as size of fruit is concerned we have gone quite far enough. The point now is to eliminate the inferior sorts. New applicants for favor need not recommend themselves on the score of being larger than a half dozen of the leading sorts already disseminated.

The three points to consider hereafter are quality and form and color. *Crescent* is, perhaps, the ideal in color, but apart from its ability to produce bushels of sour berries, averaging small, it has no claim on us. The *Wilson* has slowly been discarded, as we discarded the old *Bouchretien* Pear. No sour berry or one of inferior flavor will hold its place with consumers. The public taste has been educated to the standard of the *Seckel* Pear. Form, also, must be considered, until we can dispense with *Sharpless* and other irregular and coxcomb sorts. *Cumberland* is an ideal in form, but lacks somewhat

in substance; it is not a good carrying berry. For quality we have nothing quite to equal Lennig's White, or to surpass Prince of Berries after that; but the first of these yields a very thin crop, and the second is not profitable as a cropper, nor has it sufficient foliage and stem. The Crawford comes as near as any that I have seen to cover all demands as to quality and form and color. I have not grown it, and cannot speak for its roots. Haverland is an ideal berry, except that it lacks the very highest flavor.

I do not anticipate any startling progress in the Strawberry hereafter. We shall probably collect into a few sorts the fine points now rather scattered among many, and then content ourselves with what has been accomplished. The last half century history of this plant and of fruit adaptation make a charming chapter in the general story of the relation and co-operation of the human family and the Rose family.

Clinton, N. Y.

E. P. Powell.

[Is it not probable that longer roots in new varieties have been developed by high culture in deeply worked soil?—Ed.]

they appear if the plant is to be used especially for the effect of its foliage.

Drymonia Turialvæ is a native of South America and is an easy subject to grow, its chief requirements being a warm shaded house and plenty of water, and almost any light, rich soil. It should be allowed ample pot-room, or the foliage will not attain its full size, though a good plant may be grown in an eight or ten-inch pot. It is propagated by cuttings, which may readily be procured by heading it back so as to induce the side-shoots to break, or the plant may be cut up into single eyes—either method being successful. In fact, the *Drymonias*, in common with many others of the *Gesneraceæ*, will root from leaves, though it may take a considerable time before the rooted leaf will form an eye at its base from which to send forth a shoot.

TAPEINOTES BICOLOR.—This is another interesting Gesneraceous plant which is also a native of some parts of South America, notably of Brazil. It is, perhaps, the best species of a small genus which is nearly related to *Nematanthus*, and it has small tubular white flowers, the tube being of peculiar



Fig. 33.—*Lonicera flava*.—See page 187.

Good Plants for the Greenhouse.

DRYMONIA TURIALVÆ.—Among the many handsome and interesting plants belonging to the *Gesneraceæ* this one deserves a prominent place, for, when well grown, it makes a very attractive specimen, and is of such dimensions that room can be made for it in small collections. This *Drymonia* is not a new plant, but it is so rarely seen that it would easily pass for a novelty in many establishments. It has opposite, ovate, heavily veined leaves from one foot to fifteen inches in length, and broad in proportion, with their upper surface of a peculiar silvery gray tint, while their under surface is a dull purplish red. The flowers are axillary, creamy white, tubular, with fimbriated edges, produced on short stems, and, while ornamental in themselves, are borne so freely as to interfere in a measure with the size of the foliage if allowed to remain on the plant. It is, therefore, best to pinch out the flowers as

shape and produced from the axils of the leaves. The leaves are rather glossy and olive-green in color, and the entire plant is more or less hairy. *Tapeinotes bicolor* is also very easily increased by cuttings, and requires similar treatment to that recommended for the *Drymonia* in regard to heat, shade and moisture. It is, however, much smaller than the preceding, and does not require so much pot-room in proportion to its size. It will also be found more satisfactory to grow either of the above mentioned plants from young stock each season, as they are of rapid growth and soon attain their best condition.

STREPTOCARPUS.—In the extensive family of *Gesneraceæ* are to be found many peculiar plants, and in the latter category may certainly be placed the genus under consideration. Probably the most prominent species of this odd genus is *Streptocarpus Saundersii*, which has the strange habit of producing but one leaf, which is dark green on the upper surface and

reddish beneath, somewhat tomentose, and a foot or more in length. From the base of this solitary leaf rise the flower-spikes, bearing large panicles of lavender-colored flowers, the individual flowers not being very large but showy in the mass. A smaller species than the above, and also very pretty, is *S. Rhexii*, which flowers in much the same manner and profusion as *S. Saundersii*, but produces a pair of leaves instead of the solitary one of the latter.

All the species of *Streptocarpus* are multiplied by seeds, and may be grown in an intermediate house, where the temperature is kept at about fifty degrees. They should be potted in light loam in well drained pots or pans, and if a number of plants are placed in a pan, so as to form a mass, they make an effective group and produce a succession of bloom for a considerable time. They enjoy a plentiful supply of water, but it should be so applied that the foliage is wet as little as possible, for the leaves are liable to damp off if watered overhead.

The *Streptocarpus* is native of South Africa, and although

winters. This is, also, unfortunately true of some of the best western species.

Pentstemons seem to thrive best in a light, rich soil, in the open border, and in such a position all are perennial. *P. grandiflorus* is one of the showiest we have grown. It has spikes of pretty bluish lilac flowers and grows about two feet high. It has glaucous foliage, seeds freely, and self-sown plants produce better flowers than old ones. There is a variety of *P. grandiflorus* with dark purple flowers which is distinct and desirable. It seems constant, having come true from seed, and bids fair to be a popular plant. *P. Cobaea* has, perhaps, larger flowers than the last, and these bear a striking resemblance to the old *Cobaea Scandens* of greenhouses, with its purple, white striped flowers. The variety of *P. Cobaea* known as *Purpurea* has much darker flowers and is quite distinct. This may also be easily raised from seed. *P. ovatus* is a species with pretty bright blue flowers, which change to purple, and though in this species the flowers are smaller than in those named above, they are much more abundant. This



Fig. 34.—*Lonicera Sullivanii*.—See page 187.

the above mentioned species have been in cultivation for many years, they are seldom seen in American collections. And yet they are more worthy of cultivation, both on account of their oddity and beauty, than many plants which are much more common.

Holmesburg, Pa.

W. H. Taplin.

Pentstemons for the Garden.

THE genus *Pentstemon* is an extensive, and, with one exception, a peculiarly North American one, many species being desirable plants for the hardy-flower border, while others are showy but not hardy here in the Eastern States, and others again are of botanical interest only. One of the great charms of the English flower border in the summer months is the beautiful race of florists' varieties of *Pentstemons*, and it is much to be regretted that these are not suitable for cultivation here, being too tender to withstand our

plant is best propagated by cuttings taken in fall and wintered in pots in a cold frame. *P. diffusus* is a species of dwarf branching habit and pretty blue flowers borne in great abundance. This plant is liable to be injured in severe winters, but does well with a little protection. *P. pruinatus* is a rare species also of branching habit and bright blue flowers on stems two feet high. These two last species are also best propagated from cuttings. *P. barbatus*, var., is one of *Torreyi*, the best known in gardens and deservedly so. Its tall panicles of brilliant scarlet flowers often grow five feet high, and last in bloom all through summer. It is easily propagated by division. *P. laevigatus*, var. *Digitalis*, is a good garden plant with showy spikes of white flowers which last a long time in bloom. This plant has a more eastern range than any of the preceding, and has a robust constitution. There are many other fine species of *Pentstemon* which would be desirable acquisitions to gardens if they would prove hardy, and of these may be mentioned *P. Hartwegi*, *P. Eatonii*, *P. centranthifolius*,

P. spectabilis and *P. puniceus*, the two last being among Dr. Thurber's discoveries. We should be glad to hear of living plants of these last.

Passaic, N. J.

E. O. Orpet.

The Spring Garden.

THE Chionodoxas, popularly known as "the Glory of the Snow," a free translation of the botanical name, are among the most valuable additions of recent years to the spring garden. As the name implies, the plants are supposed to bloom in the melting snows, and, in fact, follow closely the blooming of the Snowdrops.

C. Lucilia was introduced about a decade ago and immediately excited attention by its brightness and beauty, and has evidently taken a permanent place in gardens. As it has been widely distributed by the trade, this variety is probably now very well known by most fanciers of hardy flowers, though possibly many have yet to discover its beauty when grown in liberal breadths. Like many of the small spring flowering plants they should be planted in masses, and even then they require a year or two to produce a satisfactory effect. *C. Lucilia* is found in Asia Minor only, as far as known on the Nymph Dagli Range, near Smyrna; it is a free-growing variety with one or more scapes, furnished with from two to six erect flowers with narrow white petals, tipped bright blue of the clearest shade—altogether a beautiful addition to any border. The flowers are variable in size, but in good examples are over an inch in diameter. There will be found, also, a difference in the shades of blue in the tips. Sometimes, though rarely, pure white and rose sports are found. The former of these is a lovely pure flower, and would be a valuable plant in the border could stock be had. The rose-colored sports are tinted with blue, a color not entirely pleasing. My stock of these was grown in a pan in a cold frame, which may partly account for their not being with me, at least, as strong as the parent plants.

C. Sardensis was found a few years since on the Mahmoud Dagli Range in sight of the plain of Sardis. This flower has a small white eye and the deep blue of the outer color of *Scilla Siberica*. My colony came into bloom in February and seemed to be much affected by the bad weather, so that, possibly, the newly planted bulbs may not have done their best; but, so far as I can judge, the color effect of *S. Siberica* is superior in this shade to *C. Sardensis*.

C. gigantea is a later collection from the Tmolus Range, and a very distinct, pleasing flower. The color is rather on the light violet-blue shade, with lines of darker blue. My corms are small, and flowers, perhaps, not at their best in size; but I should rate it as next to *C. Lucilia* and worthy of a place among the best flowers. This variety was latest in blooming.

C. Tmolusi is the latest variety collected by Mr. Whittall, but which I have not yet seen. It is described as a magnified *C. Lucilia*, with a deeper tint on the petals. From the collector's description it is possible that this variety is too near *C. Lucilia*, which is rather variable in size and coloring, to be considered a distinct variety. It has been collected in a different station; but when the two are cultivated together it will probably be found that the resemblance is too close to entitle them to separate names, for garden purposes at least.

C. Cretensis was the earliest Chionodoxa to bloom; but its value does not seem very great, though the waving scapes, covered with the whitish flowers, are rather graceful, and appeared when flowers were rather scarce. J. W. Gerard.

Elizabeth, N. J.

THE Dwarf White Trillium (*Trillium nivale*) is a charming little plant when well established. It comes into bloom as early as the earliest, lasts for several days, and the honey-bees swarm about the beds where it is planted as soon as the weather is warm enough for them to fly. The average height of the plant is only about three inches. It bears a single white flower an inch or more across. The three leaves, which are borne in a whorl half an inch or more below the flower, are of a waxen green, with a purplish tinge, and add much to the value of the plant. This species is not a native of New England, but is common in some parts of Ohio, Illinois and Wisconsin. It needs a fine loamy soil, with a thin shade. It should be planted in early autumn or midsummer in order to become well established before winter.

A variety of the White Dog's-tooth Violet (*Erythronium albidum*, var. *coloratum*), from Texas, now in flower, is the earliest we have seen of this genus. It is perfectly hardy, a strong grower, and, after it is established, a free bloomer. The flowers are about the size of those of the typical species, but instead of being white are of a pinkish purple tinge, and very

pretty. It is a newly-discovered variety and well worth growing.

Chionodoxa Lucilia and *C. Sardensis* are in bloom, and on account of hardiness and earliness are very desirable. In order to do well, they, too, should be planted in early autumn or midsummer. It is better to plant these early-flowering kinds as soon as they have seeded, as they are sure to bloom earlier the following spring than if not set until October. We have noted this difference in beds of Trilliums of the same kind, when some were planted early and others later. Those which were set in midsummer were a week or more in advance of the later ones.

Southwick, Mass.

F. H. Horsford.

Insecticides for Window Plants.

IT frequently happens that, despite the greatest care, insects, more especially plant lice (Aphides), will find their way into window gardens and small conservatories, sometimes seriously marring the beauty of the plants, and even of the flowers. The insecticides and methods of application recommended for destroying these pests on a large scale are often not applicable to these small gardens, which yet frequently suffer much more seriously from insect attack than do outdoor plants. Caterpillars of larger lepidoptera rarely get at these plants, and where they do hand picking is the best remedy. The little leaf rollers are much more apt to be found, and, when observed, are also most easily disposed of by being crushed in their habitations. Beetles that visit the flowers rarely do any damage, and their larvæ, where they are plant feeders, are amenable to the same treatment adopted against plant lice. These latter, and sometimes the little jumping plant bugs, are the most usual pests on house and conservatory plants. They cluster on the leaves, often causing them to curl, to become dry, brown and unsightly; on stems, causing them to become hard and woody, and on flower-buds, causing them to become aborted or to produce crippled and imperfect flowers.

In my experience, Pyrethrum and Tobacco, properly used, have both been found very effective in ridding the plants of all insects infesting them. My preference is in all cases the dry powder, applied pure and with a bellows that will enable it to be put on rapidly and evenly. It is essential to the entire success of these substances that they be very finely ground, and in this respect I have found the Persian and Dalmatian powders much more satisfactory than the Buhach or California grown Pyrethrum. The Tobacco powder should also be very fine and very dry—as near a dust as it is possible to get. In this shape I have seen it in a very few minutes clear several large Rose-bushes of their enemies. Another, and perhaps more economical and about equally effective, way of using these substances is in the form of a decoction, using one ounce of Pyrethrum or Tobacco to a pint of water. Steep as in making tea and allow it to draw well. The Pyrethrum must be kept in a tight vessel, while the Tobacco infusion loses nothing by exposure. Apply with an atomizer, such as is obtainable in all drug stores, straining the liquid before putting into the bottle for application. Both substances are almost immediately effective—the fine spray reaching everywhere, and adhering to the insects where larger drops would be shed and ineffective. The Tobacco infusion could be prepared and an atomizer kept charged near at hand, so that at the first sign of insects it could be applied. In this way house plants and small conservatories can be easily kept free from insect injury of nearly all kinds.

Rutgers College.

John B. Smith.

Chrysanthemum maximum should be found in every hardy-plant border. It is a magnificent plant after midsummer, beautiful in the border, and valuable for cutting at the very hottest season of the year. *Pyrethrum uliginosum* so much resembles a Chrysanthemum that it may well be classed with the above. It flowers late in September and lasts three weeks or more. The plants are larger than those of *C. maximum*, and they "break" like garden Chrysanthemums, making bushes three or more feet high and of proportionate breadth literally covered with flowers in their season. These flowers are not so large as those of *C. maximum*, but they are considerably larger than Ox-eye Daisies or Marguerites, which they resemble in other respects. The Pyrethrum is perfectly hardy and thrives under ordinary treatment.

Pearl River, N. Y.

John Thorpe.

Seasonable Hints.—For successful gardening it is quite as essential to know what to avoid as to know what to do, and it is particularly important to know just when to do it. The careful cultivator keeps a diary of operations for each year with an

accurate account of what was done at every date and the general weather conditions at the time, and to this he adds as the season progresses notes relating to the success or failure of crops and the apparent reasons for both. Every one who has an interest in a garden should begin a diary of this sort if this has not already been his practice. A fertile soil in good mechanical condition is the foundation of all success. If manure has not already been provided it will not do to hurry to the nearest stable and buy a supply, for it will be of little use in a garden until thoroughly decomposed so that when it is put on the soil it will be dark colored and without a trace of straw. If the ground has been well enriched in former years bone-meal, guano and chemical fertilizers are of great advantage, but these should be used only as adjuncts to well rotted stable manure. Do not begin to dig or plow while the soil is still wet. The ground should never be disturbed until in such a condition that it will easily pulverize; and when it has been plowed or spaded tender vegetable seeds like those of Cucumbers, Melons, Lima Beans, Okra, Tomatoes or Corn should not be planted in the open ground until warm weather has permanently come, which will not be in this latitude until about the 20th of May. Other vegetables should be planted as soon as possible and the earliest peas should already be in the ground. The American Wonder is the best of the dwarf Peas for family use, but there are some places where this variety refuses to grow. The little round peas should never have a place in the home garden. Of the wrinkled varieties Alpha is among the earliest and is of excellent quality. It is a good plan to make one planting of Alpha as soon as the frost is out of the ground, and then a fortnight later to plant at the same time Alpha and some second early like McLean's Premium Gem, Stratagem for later, and Champion of England for the main crop, and these will follow each other in due succession. The season can be prolonged by later plantings of Champion of England. The seed of Beets, Cabbage, Cauliflower, Parsley, Lettuce, Onions, Parsnips, Spinach, together with the roots of Asparagus, Rhubarb and Horse Radish, should be placed in the ground as early as it can be worked. Tenderer plants like Peppers and Egg Plant, which have been sown under glass, should be looked after and thinned out; they need plenty of room and ventilation on warm days so that they can be hardened. Damping off, owing to the excessive moisture and cloudiness this spring, has been a source of great annoyance. The only remedy for this is abundant ventilation and keeping the soil as dry as is consistent with safety. A sprinkling of clean, dry sand over the soil when the trouble first shows itself is beneficial. The covering should be removed from Rhubarb, Asparagus and Spinach and if the soil is dry enough light cultivation should be given to the surface.

The Flower Border.—Hardy herbaceous plants should be now set out, and so should dormant Roses and other shrubs. Beds of Pansies, Daisies, Forget-me-nots, Auriculas, etc., should be planted out now and they will be in their glory for a month or more. Seed of Sweet Peas, Alyssum, Asters, Candytuft, Larkspur, Poppies, Gaillardias, Coreopsis, Sweet William and the whole range of the hardier flowers can be now sown. Care should be taken to have the ground in fine condition and that the seeds are not buried too deeply. Seeds of the tenderer plants, if sown in the open ground now, will either rot, or if they do come up will make but feeble growth.

Bergen, N. J.

P. O.

Recent Publications.

The Forests of North America.—I.

Die Waldungen von Nordamerika, ihre Holzarten, deren Anbaufähigkeit und forstlicher Werth für Europa im Allgemeinen und Deutschland insbesondere. Von Dr. Heinrich Mayr. M. Rieger, München, 1890 (New York, Steiger & Co., 25 Park Place).

As the sub-title of Dr. Mayr's "Forests of North America" shows, his chief concern in studying our trees was to estimate their probable utility for economic planting in Europe, and especially in Germany. The author's first journey in this country was undertaken by order of the Bavarian Government, while he held the position of *Privat-docent* at the University of Munich. The second time he visited our forests he was on his way to Japan to assume the position, which he now holds, of Professor of Silviculture at the University of Tokio. His book, which was written in Japan, is primarily an official report in the interests of the industries of his fatherland. But, with German thoroughness, he has exhaustively discussed his subject from other points of view as well as from the chief one, and in many respects the work is

the most important which has yet been published on the forests of our country. It is the first which has embodied the observations and conclusions of a scientific forester, trained in all the knowledge of the schools as well as by personal experience in European woodlands, and able to take a point of view at once thoroughly scientific, and, in the best sense of the word, thoroughly practical. In the brief space here at command it is, of course, impossible really to review such a book. Each page as it is turned seems of special importance; there is no chapter to which justice could be done by a short summary; there is more than one of which the value depends upon its fullness of detail, its wealth of illustrative facts; and when the would-be reviewer has carefully read the volume his conclusion is that only a translator could fully explain its excellence and significance. So earnest is the author's interest, as a friend of our people, in the forests upon which our prosperity largely depends, and so conscientiously and wisely has he pointed out what should be done for their preservation, that he well deserves the honor of a translation. Meanwhile all that can here be done is to give a brief indication of the character and arrangement of the volume, together with a promise that, from time to time, its most interesting portions shall be placed before our readers.

It is a large and well printed octavo of 450 pages, with twenty-four pictures in the text, and ten separate plates, a map showing the different zones of vegetation in North America, and a chart giving geographical sections, for comparative use, of the North American, the Asiatic and the European continents. Two of the plates show the leaves and fruit of various North American Oaks, three the leaves and fruit of a number of other deciduous trees, one the fruit and foliage of conifers, two the seeds of conifers, one the anatomical structure of the wood of certain conifers, and one a number of the fungi which afflict our trees.

In the preface Dr. Mayr briefly tells of the inception of his task and the way in which it was prosecuted, renders hearty thanks to all who in this country gave him practical or scientific help, and outlines the scheme of his book. The text proper begins with a discussion of the conditions under which forests exist and general remarks upon forest-flora; and the forests of North America are then described and discussed under different headings. These are: (I.) The General Condition of the North American Forests; (II.) The Size and Divisions of the Forests; (III.) The Products of the Forests; (IV.) The Growth and Quality of North American Forest-trees; (V.) Changes in Forest-Vegetation through the Action of Man; (VI.) Forestry Efforts in North America; (VII.) A Special Consideration of the North American Forest-Flora according to Districts and Species; (VIII.) The Behavior of Exotic Species in North America; (IX.) North American Species from the Standpoint of their Fitness for Cultivation in Europe and especially in Germany, and (X.) from the Standpoint of their Economic Value to the German Forest; (XI.) Scheme for the Planting and Treatment of North American Species as Trees of the German Forest. The work then concludes with a twelfth section or appendix, in which we find information upon the anatomical characteristics of the woods of our conifers; a scheme for the arrangement of Pines (including non-American) according to Natural Sections; tables for the identification of the more important *Cupressinæ* by their young branches and cones, and of the North American Pines by their seeds; a description of the vegetable parasites observed on our forest-trees during the late autumn of 1885 and of 1887; a list of firms from whom the seeds of American forest-trees may be obtained; and a few notes and errata.

Two schemes were open to the writer of a book covering this ground. He might have adopted what we may call a scientific scheme, taking up each species of tree in botanical order and arranging under a single heading all the information he had to give with regard to it. Such a scheme would have been more attractive to the student and lover of trees in themselves, would have avoided the many repetitions and cross references which now increase the bulk of the volume, and would, we think, have been more easily serviceable to the European forester. But, on the other hand, the method Dr. Mayr has in fact adopted gives what the other scheme would not have given—complete pictures of the forest-flora of our different zones of vegetation. Such pictures the reader would otherwise have had to compile in his mind from a multitude of isolated passages. Now what he has thus to compile is the author's information and opinion with regard to any given species which may specially interest him. The scientific student might have preferred the botanical arrangement; but to the general reader, in any part of the world, the actual one will undoubtedly be more attractive. Nor, in his case, are the

repetitions it involves to be regretted. The more important facts are insisted upon, and the more often they are re-told with varying words, the more likely they are to impress the mind of any but a serious student.

And there are innumerable facts and conclusions and counsels in this book with which it would greatly profit the general reader in America to become thoroughly familiar. Nowhere have we read a fuller, clearer or better emphasized account of the damage which has already been done to our forests, which is still being done, and which threatens to continue until there is nothing more to damage; and nowhere a more judicious statement of the certain consequences of its persistence or of the methods which should be adopted to stay it. To a German trained in forest-conservation, the scenes now presented by our woodlands, and the scenes they suggest to an imagination which looks even fifty years ahead, may well have seemed as incomprehensible as horrifying. It is in truth a tragic panorama, and Dr. Mayr paints it in words which, while carefully based on actual facts and never falling into hyperbole or mere declamation, are of tragic intensity. As we read the chapter with the seemingly peaceful heading, "General Condition of the North American Forests," we seem to be assisting at a reckless, senseless conflict at once murderous and suicidal. We see a people, now the richest in the world, which, for the sake of a little more immediate wealth—or often for the sake of nothing but mere destruction—is sweeping away the most magnificent of Nature's gifts, and one that can never be replaced, is hopelessly ruining the aspect of vast areas of beautiful country, and at the same time is working with frightful celerity for its own ultimate impoverishment. Most of the facts and figures and descriptions which Dr. Mayr gives in drawing this general picture have long been painfully apparent to a few Americans, and have often been reiterated by them to the deaf ears of their countrymen at large. But as here massed together, as they appeared to a fresh and sagacious eye, they gain a new significance and stand out in even darker colors. It seems as though, could this chapter be translated and spread abroad in a million copies or so, the whole people would rise in a horrified awakening and make an appeal for self-preservation which even the dullest legislative body could not resist. To quote anything he says would be useless here; our readers, we trust, already stand at Dr. Mayr's point of view; and, we repeat, it is the massing of his facts which gives them their singular vividness. It would be painful to think of the spectacle we must present, as thus reported, in the eyes of German readers, were not the practical bearing of the matter on our own future so vital that room is not left for any minor sting.

It should not be supposed, however, that Dr. Mayr writes in an unfriendly or even unsympathetic spirit. As he never speaks without facts, so he never exaggerates in drawing conclusions. He is quick to note all possible excuses which may be made or fancied for our madness, even to the fact that we are so largely the offspring of that English race which lives in a little level world where forests do not exist and the need of them is not felt; and he is diligent in recording all the little public efforts that have been made in the way of reform, and all the private enterprises which indicate that there are individuals among us who know the truth and are anxious that it should be impressed upon the people at large. He praises the Arnold Arboretum heartily; and his appreciation of the Jesup Collection of Woods in the Museum of Natural History in this city will go far to prove to its donor and the officials of the institution that their work has been well done. He describes the scope and arrangement of the collection, notes the giant dimensions of some of the specimens, and says, "Certainly nothing has been spared in securing them; such colossal specimens can be shown by no other museum in the world." And, of course, he appreciates the fact that this collection, the dendrological herbarium at Brookline and the neighboring Arnold Arboretum each gains in value by the complementary usefulness of the others.

Yet, after making all possible deductions from the picture of blind ravage which he draws, we can fancy Dr. Mayr laying down his pen with a sigh of despair—so few and small are the bright spots, so alarming is the blackness of the picture as a whole. Some day, of course, as he says and we all know, there will come enlightenment and reform. But how much unavailing remorse will mingle with them, even though they come very soon; and is it not possible that they will come when practically too late? It is impossible to calculate, says our unwilling critic, whether complete forest-destruction, such as we see in the Holy Land and in certain parts of southern Europe, will be reached in fifty years, should our present methods continue, or will need a couple of decades more.

When he adds, it is unfortunately improbable that within the next few decades our country will be so far advanced as to take "systematic care of its magnificent forest-treasures," the suggested prospect may well excite alarm. No passages in his book, by the way, are more interesting and instructive than those which show why, when the primeval forest is destroyed, it can never be replaced by man or renew itself in man's vicinity; but these we reserve for full translation at another time. We must once more explain, however, Dr. Mayr's exact attitude. He is not an enthusiast, who, in his love for the forest, forgets the needs or the right desires of man. He does not ask that everywhere the forest shall be preserved, nor make the beauty of the landscape the prime reason for its protection. On all arable low lands, he explicitly says, the forests should and must be cut away; and their preservation in the mountains he shows of course to be as truly in the interests of man as in those of the trees themselves.

Correspondence.

Why Not Legislate Against the Black Knot?

To the Editor of GARDEN AND FOREST:

Sir.—There are some good reasons for legislating against the Black Knot (*Plowrightia morbosa*) of the Plum and Cherry trees. In the first place the fungus is beyond question extremely destructive; whole orchards of large size in many parts of the country have been abandoned because of this parasitic plague. Secondly, it is a conspicuous disease and during the half of the year when the trees are defoliated the knots can be found without the least difficulty. Any attempts to shield the trouble, on the part of the owner, would be fruitless even if he should care to preserve the curse. In the third place, the remedy is the very heroic one of the knife, and easily, safely and with certainty applied. There may be some compounds put upon the diseased parts that will kill the fungus, but it is so deeply seated that when a twig is thoroughly infested there is little left for the fruit grower to do but cut away and burn the black excrescences. If a tree is badly attacked the wisest method is to cut down bodily and destroy it by fire. Finally when once the old knots are cleared out it will be an easy matter to keep the fungus from gaining a fresh foothold.

There are many trees which are literally covered with knots and have been for years; trees which bear no fruit, and never will, and they are worse than mere monuments of carelessness, for they propagate and perpetuate a disease that renders Plum-raising almost an impossibility in their neighborhood. Sometimes these old distorted trees are upon the roadside where any passing lad can pull off and carry to his own home one of these malformations to become a new center of infection. But these knots do not need to be transported to produce infection, for the millions of spores developed in the spring, while too small to be seen, pass long distances with the winds and thus spread the disease.

There are several fungus diseases against which the state legislatures or the national congress might pass enactments fully as wholesome and beneficial as those for the control of the diseases of animals, but few of them offer so many favorable points for successful legislation as the Black Knot—the scourge of Plum and Cherry growers in many localities. The law should include, to be effective, all Wild Plum and Cherry trees that are breeding places of the pest.

Rutgers College.

Byron D. Halsted.

Public Forest Associations.

To the Editor of GARDEN AND FOREST:

Sir.—Apropos of the plans for saving the Waverly Oaks, I should like to urge again a general proposition for the accomplishment of public purposes of this kind, which was broached some months ago in another place, and which seems to me entirely practicable. It is that there shall be organized and chartered in the State of Massachusetts a public forest association, whose principal object—no doubt it would be well to make it its only object—would be the acquisition of the title to tracts or lots of land which, from their natural beauty or picturesque significance, or from the fact that they include trees or plants which are of historical or botanical importance, it is desirable to preserve for the public benefit.

Such an association, if established in the proper way, could hardly lack members; and the means necessary for purchases, provided the power to condemn land was not given to it, could be obtained through subscriptions from time to time, or

through endowments which the wealthy would surely provide when such a work had attained the repute and honor which it would deserve.

The model of such an association is found in the Lynn Public Forest Association, whose work, thanks to the acquisition of nearly the whole of the great Lynn Woods by the City of Lynn, is now rendered unnecessary, or, rather, adequately crowned; for the creation of the magnificent Lynn park of about 1,200 acres is really the outcome of the work of this Society. It was this body which succeeded in checking the destruction of the beautiful Hemlock timber in the deep glen on Penny Brook, and which rescued several other sylvan spots in the same neighborhood from profanation simply by buying out the profaners. And the public spirit which its work stimulated no doubt made possible the reservation of so splendid a domain for public use in perpetuity.

Apply the principle, so successful in one small city, to the commonwealth, to any state or to the nation. Let public-spirited men and women unite in such an association, and seek charter and authority to acquire property under proper restrictions. I know of no cause in which the power of eminent domain could be invoked more righteously than in protecting from private destruction the exceptional and striking natural beauties which are equally dear to all, or in preserving the groves or trees around which the people's history or legends cluster. But even if such an association had not authority to acquire property by condemnation, the possession of a considerable emergency fund, accumulated in advance and ready to be judiciously drawn upon at once by alert men, would in a great number of cases prevent the defacement of scenery, or the destruction of woods or individual trees which centuries could not replace.

The best work that has ever been done in this country, in the way of reform and public enlightenment and education, has been at least put in motion, if not completely accomplished, by private effort represented in associations. It seems to be almost idle to try to get Congress or Legislatures to do anything toward saving the great forest-domains. But is it not possible to make use of the great instrumentality of voluntary association to save the spared monuments of a sylvan past still remaining to us?

Boston.

J. E. Chamberlin.

The Rest of Plants.

To the Editor of GARDEN AND FOREST :

Sir.—1. Do all plants have, or require, an annual "resting-period"? If so, how much is meant by that term?

2. Is it true of all the ordinary window-plants, such as Geraniums, Fuchsias, Gloxinias, Shrubby Begonias, etc., that they require a season of retirement, or letting alone, in some part of the year?

3. Can any general rules or directions be given for thus "resting" plants which will be of service to the amateur window-gardener; or must one know the habits, the natural resting-season, of each plant or species?

4. Can you name any work or article already in print which treats of this subject in any detailed way?

Whitewater, Wis.

A. S.

1. So far as I know, all perennial plants undergo a period of "rest." It is not certain, however, that this "rest" is in any sense a recuperation or recreation to the plant. It appears to be a hereditary trait, induced by natural environment, a means by which the plant resists untoward circumstances of climate. These untoward circumstances in nature are variations in temperature or moisture, or both. In the dry seasons of the tropics plants "rest" in much the same manner as in northern winters. Any attempt in culture to overcome the "resting-period" is apt to injure the plant, from the fact that any energy used in the partial or abnormal development may be subtracted from subsequent growth or development.

2. I know of no investigations to show that this hereditary trait of plants has ever been entirely overcome by culture. Our window-plants still demand "rest."

3. In practice, however, it is in every way more desirable to start ordinary window-plants anew every year than to attempt to handle old ones. Young plants are vigorous, healthy, floriferous and economical of space. Started in late winter or in spring, they will bloom the following winter, after which they should be discarded. But if old plants are retained, I cannot state any general rule for

"resting" which will apply, with any value, to all kinds.

4. The best literature of the practical application of the "resting-period" to plants is found under the discussions of the various species, in garden manuals. L. H. Bailey.

The Cork-wings on the Sweet Gum.

To the Editor of GARDEN AND FOREST :

Sir.—The Sweet Gum, *Liquidambar styraciflua*, which, from its handsome habit of growth and rich autumnal coloring, has been extensively planted in Tower Grove Park, in this city, shows a good deal of variability in the development of "cork-wings" on its branches—a development for which it is noted, and which has received considerable attention from histologists, one of the latest of whom, Miss E. L. Gregory, has given an extended account of it in the *Botanical Gazette* for 1888 and 1889.

While it appears to be the rule for the branches to bear two or more prominent wings on their upper side (this position, according to Miss Gregory, being peculiar to this species), it is noticeable that not far from one-half of the trees in the park named are destitute of such wings, while a few others possess few of them. The trees compared are of the same age, have grown under similar conditions, and no observable reason for the difference noted is to be seen, the winged and wingless specimens occurring with no regularity. These trees are now about seventeen years old, and the difference referred to appears to depend upon inherent peculiarities of the individuals, since the smooth trees have always been destitute of wings, while these appendages were early developed in the others. The different appearance of the two sorts of trees is very striking when the leaves are off in winter. It is quite as evident in considerably larger and older trees than those illustrated.

Botanic Garden, St. Louis.

Wm. Trelease.

[Photographs which accompanied this letter clearly show the differences described by Professor Trelease.—ED.]

Gordonia Altamaha.

To the Editor of GARDEN AND FOREST :

Sir.—The best specimen of *Gordonia Altamaha* in the District of Columbia grows in Lafayette Square, in front of the White House. The tree, or rather large shrub, which is in vigorous health, is nearly, or quite, twenty feet high and ten feet through. I supplied this as a small plant about the year 1855. It grows and flowers freely, and has not been injured by cold. There are few, if any, other specimens about the city, except those growing on my nursery grounds, on a dry, rich bottom land, where they grow and flourish with great vigor. They pass through ordinary winters without harm, but in one severe season the young growths were killed. The plants, however, all quickly recovered.

I doubt whether this *Gordonia* will succeed much farther north, unless planted in a warm, sheltered position. I know of no other tree or shrub, that blooms at the same season, which can compare with it in beauty. Its pure white flowers are produced in July, and appear abundantly up to October, and even on till the middle of that month. The foliage assumes, in autumn, a rich crimson tint, which is quite distinct and striking.

Washington, D. C.

John Saul.

Notes.

The Maples growing in the gulches on the western slope of the Sierra Nevada have been tapped this year, and although they do not yield such an abundant flow as the Sugar Maple, the sap is said to be sweeter and makes finely-flavored sugar.

It is said that no less than 7,769 school-gardens exist in Austria, not including the sister kingdom of Hungary. They are connected with both private and public schools, are used for purposes of practical instruction in horticulture and tree-growing, and often contain botanical museums and bee-hives.

One of the most interesting flowers we have seen this spring is the white *Chionodoxa*, which Mr. Gerard has grown from bulbs sent to him last autumn from Asia Minor, by Mr. Whittall. The color is pure and the flowers are held well up above the foliage. Mingled with the deep blue of the ordinary kind the effect will be very beautiful. White flowers of this class, too, are rare after the Snowdrops are over. These plants are very rare in their native home, and Mr. Gerard's experiments to ascertain whether they will come true from seed will be watched with interest.

Another instance of the way in which our florists now devote themselves, very often, to raising large quantities of a single kind of flower is found in a note, dated Springfield, Massachusetts, which was recently published in the *American Florist*. "I grow Carnations only," said the writer, "and last season I cut 26,000 blooms from 700 plants of Grace Wilder. I now have 1,300 plants."

A lady who read a paper at the meeting of the American Horticultural Society, which was held in February at Austin, Texas, recommended that the effort to agree upon a "national flower" should be abandoned; but that instead each state should select a flower for itself. Thus far the advice seems good enough, if, indeed, the subject has any real hold on popular interest. But when we are told, furthermore, that on occasions of national significance all these "state flowers" may be massed in a great bouquet or garland, the picture presented to the imagination is not very agreeable.

German horticultural papers speak highly of a variety of *Begonia florida incomparabilis* which has been named "Hofgärtner Pettera" after its introducer, the gardener of Duke Philip of Wurtemberg, at Gmünden. The flowers, which are dark carmine, "completely cover the plant;" but its great peculiarity is the color of the leaves, which, when exposed to full sunshine, "become a deep blood-red, while the stem and leaf-stalks are coral-red." It is recommended as a valuable addition to the plants now used for carpet-bedding and for multicolored groups.

A peculiarity of the plants producing what we call gourds or calabashes is the musk-like odor that most of them give out when their leaves are pinched. We generally look upon a gourd as something unsuitable for the table; but Dr. Harris states that when cooked several of the varieties of Syria, Japan and Brazil are quite palatable while young, especially those which grow long, thin and green, like the Hercules Club. The fruit which furnishes the reticulated skeleton used as a bathing-scrubber and in making beautiful bonnets is in habit and growth a Cucumber (*Cucumis reticulatus*), although sometimes called a "Dish-cloth Gourd" from one of its uses in our Gulf States. In India the natives eat one of the varieties when quite young; but of a dozen varieties grown by Dr. Harris in Philadelphia none were tempting to the appetite.

A corporation called "The Blue Mountain Forest Park Association" has been formed at Newport, New Hampshire, its President being Mr. Austin Corbin, of this city, whose summer home lies in that region. The purposes of the Association are to breed American game and fish, to cultivate and properly administer the forests, and to form and beautify parks and avenues. Seventeen head of buffalo have been turned out on a "range" which embraces about 10,000 acres, and it is hoped that the race may thus be preserved from extinction. The good done by such an association, however, will spread far beyond its own property, for it will doubtless incite the citizens of other localities to imitation, and must help to prove to the people at large that our forests are worth preserving, and that the adornment of country neighborhoods should be systematically undertaken.

We have received the first number of *Zoe*, a new biological journal to be published monthly in San Francisco. It is intended as a "medium for recording in accessible form the numerous, often unconnected observations, pertaining more particularly to the western part of North America, made by amateurs as well as by working naturalists." The name of the editor does not appear in the prospectus, but contributions are promised, and many of the promises are fulfilled in the first number, by articles from many of the best known naturalists of the Pacific States. The first number contains botanical notes by both Mr. and Mrs. T. S. Brandegee, and the first of a series of important articles on the naturalized plants of southern California, by Mr. S. B. Parish. *Zoe* is in magazine form, in octavo, and the first number contains thirty-two handsomely printed pages. It is published by the Zoe Publishing Co., of San Francisco, and the annual subscription is two dollars.

One of the most perfect trees in the United States stands behind the old Drayton Manor House on the Ashley River, not very far from Charleston, South Carolina. It is a Live Oak. The trunk girths, at five feet from the ground, nearly twenty-five feet, and the main branches, which shoot out at right angles from the trunk at the height of ten feet above the ground, have a spread of one hundred and twenty and one hundred and thirty feet, and form a dense, symmetrical, flat head of indescribable beauty and impressiveness. There are larger Live Oaks to be seen, but it is rare to find

one of the age and size of the Drayton tree of such perfect shape and in such good health. There is nothing about the tree to indicate very great age, and as it is a well known fact that the Live Oak grows in good soil with extreme rapidity, it is not improbable that the two centuries during which the Drayton family have occupied the Manor House may cover the span of its existence.

Writing on "The Slave Trade in the Congo Basin," in the April number of the *Century Magazine*, Mr. E. J. Glave says that nature has, in the case of the African, met the universal desire for a drink stronger than water by providing him with the juice of the Palm-tree, "a most palatable beverage, resembling when fresh a very strong lemon soda, but intoxicating in its effects. . . . The villagers in charge of this particular industry climb the tree, trim away some of the leaves, and then bore three or four holes, about half an inch in diameter, at the base of the frond, to the heart of the tree." A small gourd is placed beneath each of these holes, and receives during the day about half a pint of juice. "The contents of these gourds are collected every morning. This beverage is called by the natives *malafu*, and is well known to all European travelers as Palm-wine." From the author's accounts of the drunken revels which he witnessed, it seems to be as potent, in its ultimate effects, as the most civilized of fermented drinks.

Odontoglossum Pescatorei is the rival of *O. crispum* as a garden Orchid. In their cultural requirements and in general habit they are alike, whilst in attractiveness there is little to choose between them. Both species have revealed under cultivation an extraordinary range in the size, form and marking of their flowers. Now and again a variety of startling character appears, and if placed in the market fetches a sensational price, as, for example, Veitch's variety of *O. crispum* and Veitch's variety of *O. Pescatorei*, both of which are in Baron Schroöder's famous collection. The last sensational feat has been the production of an inflorescence by *O. Pescatorei*, upon which no less than 130 blooms were borne! The length of the panicle was four and a half feet, or more than double the maximum length given in Veitch's *Orchid Manual*. It bore fourteen branches, which again ramified. The plant must be of extraordinary vigor, as its pseudo-bulbs are described as being as large as large hens' eggs. It is in the collection of Mr. J. B. Merriles, Reading, and was grown by his gardener, George Russell.

We have received from Mr. O. C. Simonds, Superintendent of Graceland Cemetery, Chicago, a series of photographs illustrating the method of transplanting large trees. Of two trees moved together the larger was sixty feet high, with a spread of branches of sixty feet. The roots were taken up in a circle of about the same diameter, tied up in bundles, wrapped in canvas and kept moist. The trees measure respectively seven feet three inches and six feet in circumference, the measurements being taken at three feet above the ground. The earth was retained about the roots for some distance from the trees, which were moved in an upright position. The planting was completed on the 4th of May, 1889. The trees grew nicely during last season, and Mr. Simonds believes they will become as firmly established as they were in the woods from which they were taken, although it is yet too early to speak with entire confidence as to the result. The trees were moved on rollers nearly a mile in an upright position, stayed upon a heavy frame-work of timber, and the cost was between five and six hundred dollars.

According to a correspondent of *Gartenflora*, the splendid crops of Hyacinths which are grown in the vicinity of Haarlem, in Holland, require a careful preparation of the soil. A field which the following autumn is to be planted with bulbs is worked over during the winter to a depth of three feet, in order that the upper soil, in which bulbs have already been grown, may be thoroughly replaced by fresh sand; for it is almost pure sand which forms these fields along the dunes. Simple cow-manure is then applied, and Potatoes are planted, and after these are harvested the soil is again worked over. About the beginning of September the bulbs are planted and covered with a layer of sea-weed, which is removed early in the spring. The yellowish leaves which have sprouted under the mulch quickly turn a deep green, and by the middle of April the flowers spread their immense many-colored carpet before the eye. As soon as they begin to fade they are cut off to direct all the strength of the plant toward maturing the bulbs. Formerly the cut flowers were sold, largely for the English market; but this sale so injured the demand for bulbs that, by agreement among the growers, it has been abandoned.

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An English Forest.

AN old English forest is a very beautiful and interesting thing, although, judged by the standard of modern forest science, it is practically a useless encumbrance of the earth, to be cleared away that the ground it occupies may be replanted to better advantage. Such a forest is that of Sherwood, in Nottinghamshire, the most famous and historically the most interesting of all the remnants of the ancient forest-covering of Britain. A view taken in this forest appears in our illustration on page 203, and represents a portion of the high-road leading through "Bircklands," as one part of Sherwood Forest is called, because Birches grow in great numbers among the old Oaks. The forest-floor is densely covered with Bracken (*Pteris aquilina*), making a charming carpet among the trees, which stand singly, often with wide places between them and unsurrounded with young trees growing up to replace them. Deer and rabbits have frequented Sherwood Forest for centuries, and it has been pastured at times and sadly neglected and abused; every seedling-tree, as fast as it appears among the Ferns, is nibbled off and destroyed, and no successors to the great old trees have been allowed to grow up to take their place when they have lived out their long lives. Very few of the old trees are left; multitudes of them fell a century or more ago to replenish the purses of needy noblemen, and time has laid a heavy hand upon those which escaped. And now this forest, which is really not a forest at all, but rather a thickly planted park, bears about the same relation to a modern European forest that an English farm, with its wide, useless hedgerows, its broad branched Elms shading the ground, sucking up moisture from the earth and using up plant food, its game carefully protected to feed upon the crops, and all its wasteful methods of pasturage, bears to a modern German farm, in which every inch of ground is made productive and not one ounce of anything is wasted.

A drive through Sherwood Forest is one of the most delightful things an American can do in England, although he will not learn much about forestry on his trip or see many things which can be applied in his every-day life at

home. A visit to Sherwood Forest and "the Dukeries," as a number of country places made in what was once a part of the old forest and lying adjacent to each other are called, is a common English holiday trip for people living in the cities of the midland counties, and thousands make it every year. The excursion is easily made from the town of Worksop, in Nottinghamshire, and a day is needed to make the circuit of thirty miles through the different estates and the remnants of the forest. Two or three days, however, can be well employed in the neighborhood of Worksop if the visitor is interested in gardens and in fine houses as well as in old trees. One may see in these two or three days Worksop Manor and park, lying close by the town—a fine park, now the property of the Duke of Newcastle, the house, however, much reduced by fire from its old estate. It was the home of the Earls of Shrewsbury, and stout Bess of Hardwick built the mansion or finished it, and ruled over its destinies, as she did in one way or another over all the great families of the county. Mary Queen of Scots was once a prisoner in this house. There are a few fine trees in the park, including a group of noble Oaks not far from the mansion. A little beyond Worksop Manor the high-road leads into the enclosure of the park of Welbeck Abbey, where the visitor will find the winners of two successive Derbys and the most successful breeding establishment in the history of the English turf.

Just beyond Welbeck is Clumber, the seat of the Duke of Newcastle. The house is low and badly placed, and dwarfed, moreover, by the ugly church just completed, which is placed too near the mansion, with whose architecture it does not harmonize. The handsome terrace joining the house with the lake is one of the most successful in England; and the view across the lake to the rolling park beyond is very fine. There are noble trees in the pleasure grounds and in the park, and the lake, with its margins lined with wild plants and stocked with wild fowl, is certainly a most wonderful imitation of nature. The view of the mansion from one of the drives where it crosses a narrow arm of the lake on an old arched stone bridge is deservedly famous. The house contains many fine pictures and other works of art. What will strike, perhaps, the American visitor to Clumber are the countless thousands of rabbits running about every part of the place, which seems completely undermined with their burrows. The park contains no herds of deer, which abound at Welbeck, and in Thoresby Park, which is just beyond Clumber, and from which it is separated by two pairs of gates.

Thoresby, the seat of Earl Manvers, by far the most beautiful of "the Dukeries," and one of the most interesting places in all England, has a noble new Elizabethan mansion, built on high ground, overlooking the large artificial lake, close by which the old house stood. The park is twelve miles round, and contains many interesting and exciting views and many noble trees. Not far from the house is a small-leaved Linden-tree not easily matched anywhere, and across the lake is an avenue a mile long of splendid old Chestnut-trees of immense size, forming a long vista which loses itself in the mysterious depths of Sherwood Forest beyond. In the shubberies near the house, although not very long planted, are the finest specimens of the Hemlock-tree of the high Sierra Nevada (*Tsuga Pattoniana*) which can be seen in Europe. The present Earl Manvers is a planter of trees, as the young plantations all over the estate bear witness; and at one point the drive leads through a real forest of Beech-trees, with tall, straight trunks, which a German forest-master would not be ashamed of. Deer wander through the park right up to the terrace-wall and to the gates of the courtyard, and from the house great flocks of sheep and herds of cattle can be seen feeding under the park trees, giving life and variety to the scene and adding much to its attractiveness.

Passing out of Thoresby Park gates the road leads directly into Sherwood Forest at the point where the view in our illustration was made. Then it stretches through

"Bilhagh" and "Bircklands," under the sturdy branches of the "Major Oak" and by some of its hardly less famous companions, and then, leaving the forest and skirting the park and woods of Welbeck, it returns to Worksop through rich farm-lands held by tenants of the Duke of Portland. Newsted Abbey, the home of Byron, is within easy driving distance of Worksop, and forty miles away in the other direction is Chatsworth, the seat of the Duke of Devonshire.

This short sketch is not meant as an account of Sherwood Forest or of "the Dukeries." They are described over and over again in books which treat of rural England, and in the pages of English journals of horticulture. Our object in alluding to them is to remind our readers that if they visit England they can see in the neighborhood of Worksop, better perhaps and more easily than anywhere else, what rural life means to English noblemen.

THE great advance in horticulture during the last twenty or thirty years is due largely to the sustained and intelligent efforts of those specialists who have devoted themselves to the study and improvement of particular classes of plants. Such men, for obvious reasons, have been more numerous in Europe, particularly in England, than they have been in this country. We can point, however, to conspicuous instances of long continued horticultural experiments in America, and as wealth and leisure increases here they will probably become more frequent than they have been. Mr. Hunnewell, who relates in another column the conclusions he has reached from long years of patient cultivation of the Rhododendron, shows us what an individual interested in a particular class of plants can accomplish in increasing the stock of available knowledge relating to his favorites. Mr. Hunnewell has for nearly forty years been the most munificent patron of horticulture in America, and his gardens at Wellesley, in Massachusetts, are famous from one end of the land to the other. But unlike many another horticultural Mæcenæ, he does not content himself with the mere lavishing of money in gardening, but practices the art himself, knowing his plants and all their requirements thoroughly, and devoting himself year after year, and often in the face of great disappointments, to the study of his favorite Rhododendrons and of the great collection of conifers for which his garden is also celebrated.

When the cultivation of Rhododendrons was first undertaken at Wellesley little was practically known of the proper methods of growing them in the United States, and nothing at all of the sorts suited to our climate. To give a full and fair test to all attainable varieties of these plants demanded rare steadiness of purpose, but Mr. Hunnewell's patient labors were renewed year after year with never flagging zeal and enthusiasm. When his first Rhododendrons were planted, it was believed by most Americans who knew anything whatever about them that any effort to cultivate them here in the open air would be hopelessly wasted. But forty years of experiment has proved that many of the very best varieties will grow in New England as readily as a Lilac or a Guelder Rose, if certain simple cultural conditions are supplied. That such men as Mr. Hunnewell, generous, public-spirited and patient in pursuit of knowledge, appear occasionally among us, is certainly the most hopeful sign that American horticulture is advancing to the broader and better fields we confidently predict for it.

THE proposal of the Park Board of this city to remove the collection of animals in Central Park from their present quarters to a larger space of open meadow on the opposite side of the park has called forth a vigorous protest from the entire press of New York. The objections to this scheme are not based on the opinion that the ground now occupied by the menagerie is a suitable one, nor on the assumption that a good zoological garden is not altogether a worthy object to strive for, but on the conviction that the open spaces of the park are too valuable to be sacrificed to

any exhibition of the sort, however desirable in itself. Our own belief is that this conservative view cannot be too strenuously insisted upon. It is these tranquil meadow surfaces which make the park efficient as a refreshment and a relief from the rigid lines of streets and buildings; and the paramount duty of all who have any influence in these matters is to guard against any possible encroachment upon these areas of greensward and their border of trees. These open meadows, of which there are now too few, and which were created at great expense, constitute the primary and essential value of the park, and to obliterate them is a practical confiscation of public property. It is encouraging to find that every attempt on the part of any special interest to occupy and possess these grassy openings gives occasion for the people and the press of the city to demonstrate how profound is their appreciation of the true function and the highest purpose of the park.

Native Shrubs of California.—III.

Garrya elliptica, Dougl. ("Bot. Reg.," t. 1686). From the figure given in the "Botanical Register," more than fifty years ago, taken from a specimen which had flowered in England, one would not infer that the species deserved mention among the really very ornamental shrubs of California. Perhaps it did not find in England a congenial climate. In its native localities among the Coast Mountains, growing, in clumps, from six to ten feet high, with its dark green, leathery, wavy-margined foliage, it is never unsightly; while at flowering time it appears very uniquely beautiful. The inflorescence, while amentaceous, and therefore like that of Alders and Birches in kind, is of a much more showy character. The tassels, those of the male shrub being commonly eight or ten inches long, very slender, and of a pale green which harmonizes well with the dark hue of the foliage, are hung forth from two to four or five in a place, at the ends of all the branches and branchlets; and being of such length, some of them fall across lower branches and often hang in festoons, draping most gracefully and attractively the whole bush. The flowering occurs usually in early February, after the first week of mild, sunny spring weather; and the long light chains of pale olive green, naturally of only ten days' duration at best, are sure to be gathered from the bushes, almost before their full development, by afternoon strollers in quest of earliest wild flowers.

One or two other species of *Garrya*, found southward in the state, or in the mountains of the interior, are less ornamental; but by virtue of the strongly tonic property of their bark, they are well known to miners and mountaineers, who employ them as a remedy in ague and intermittent fevers. The bark of the Cornel or Dogwood of the Atlantic States has the same qualities; and there are botanical systematists who consider the *Garrya* and the *Cornus* as belonging to the same family, although they bear not the least external resemblance to each other. All the *Garryas* have, however, the same fine-grained, very hard wood as the Cornel. But for its uniquely beautiful appearance when in flower our *Garrya elliptica* deserves a conspicuous place in every shrubbery. Lindley described it as hardy in England; but it is doubtful whether it would endure well the dry cold of the New England winter.

Ribes tenuiflorum, Lindl. ("Bot. Reg.," t. 1274). I must speak first of the bibliography of this, our Californian Yellow Currant; for I have long perceived that all American writers of the present generation confuse it with the Missouri Currant (*R. aureum*). The two species are entirely distinct, as I have clearly seen ever since my earliest years in California. The last-named does not grow either in California or anywhere west of the Rocky Mountains. The former is found along the eastern bases of the Colorado mountains and for some distance eastward. The confusion of the two began with Pursh, who, in 1814, had both in mind when he described his *R. aureum*. According to Lindley, Pursh's dried specimens were of the far western shrub from the Columbia River-region, not then introduced into England, and his description was drawn up from living bushes of the true Missouri Currant, at that time already in cultivation there. Nuttall had in 1818 indicated that he considered it to be two varieties of the *R. aureum*; but Lindley in 1829 made clear the specific differences, and gave the name *R. tenuiflorum* to the Pacific coast species, reserving the name *R. aureum* for the one then best known, giving as his reason the fact that this had been the shrub from which Pursh had drawn up his specific character. Both species are figured in the "Botanical Register," *R. aureum*, at t. 125; but they are represented in flower only; and if these plates

exhibiting mere branches in leaf and flower had left nothing untold, botanists would have been excused for treating them as one species. The essential differences between them, apart from considerations of geographical distribution, reside in certain strong characteristics of the flowers and fruits. The sole recommendation of the old and true *R. aureum*, or Missouri Currant, is the delicious spicy fragrance of its flowers. *R. tenuiflorum*, all the way from middle California to the British boundary and across the country to Colorado, has flowers entirely scentless. Its berries are large, of a beautiful amber color, deepening to a paler than cherry-red in fullest maturity, and have an acidulous taste without aroma. Those of the real *R. aureum* are smaller, black, sweet and with a decided black currant flavor.

The Pacific species grows ordinarily to twice or thrice the size of the eastern, and its fruit is valued, even in the wild state, in those remote, still sparsely-settled and little cultivated parts of northern California where it abounds. It is probable that under cultivation it would rise to a place of some importance. But, as above intimated, it is entirely destitute of that one quality, the rich odor of the flowers, which has made its more easterly ally a universal favorite in spite of the worthlessness of its fruit.

University of California.

Edward L. Greene.

The Woods in Spring.

WHEN the army of white-throats and Savannah sparrows, in their migrations, have flown farther northward, and the "chippies" have become more abundant; when a few "chebecs" and "towhees" are heard introducing themselves to the passers-by, just before the bobolinks and orioles arrive, it may be called the misty season in the woods. You can name no special date when it is at its height, for it comes from the buds so gradually and ends in the larger, coarser spray with such slowly measured growth; but while it lasts the view of the young foliage, lingering on the tangled network of twig and branch, like variously colored scraps of vapor, is, indeed, charming.

No system of color language can describe accurately the various shades of the early dresses of the trees. Many of the hues are softened and subdued, in contrast to the gaudy colors of autumn. Green, in its many tints, is from the first put on numerous species. How becoming are the Alders and the Birches in their fresh, new trimming! The leaves of the Oaks, Maples and Hickories, just unfolding from the buds and flecking the sky with the mellow stains of yellows, reds and browns, are especially attractive. The conditions and surroundings of the trees have much to do in painting the foliage before the chlorophyll has dyed it for its summer's work. The saplings and sprouts of the White Oak are decked with scraps of maroon velvet cut into the regular established patterns, while the leaves of older trees of the same species, on higher ground, are often the color of amber or of half-ripe lemons. The evenly plicated leaves of the Wild Cherry shine like bronze in the sun. Here and there the Large-Toothed Aspens have arrayed themselves in white silky-wool attire, and, as they rise like clouds in fleecy masses amid the early spring foliage of the hard-wood trees, they form very conspicuous objects in the forest.

How exquisitely tender and transparent is the new leaf of the American Basswood! I can hardly bear to look through it at the sun. When it is closely laid on paper, writing can easily be seen through. Viewed in the light it assumes a yellowish cast, and you not only see the slender forked veins, extended at regular intervals from the midrib, but hundreds of gossamer cross lines, like those of spiders' webs, which form the frame-work of the delicate structure. Its shape is beautiful, with sweeps and curves, and its edges are fringed with the finest teeth. What special wood fairy has been appointed to give it such elegant proportions and to cut all of the leaves of the *Tiliaceæ* into the peculiar oblique, heart-shaped pattern? The largest lobes at the bases are invariably placed toward the young shoots, and the leaves are arranged upon them so as to secure the greatest amount of light and air.

The Beeches answer to the call of the sun a few days later than the Basswoods. A copse yonder on the hill-side is just beginning to put out its broidery. Little mouse-ears of leaves, clothed with silken hairs, are unfolding from the brown, rusty scales and lengthened buds; yet, curiously enough, the leaves on the twigs of a few saplings that touch the boles of the larger trees are already more than half grown! Was it the partial shelter in which the buds were placed during the winter that caused them to gain such a start? The Beech-leaves are formed into the most elegant designs. How fresh and beautiful these premature ones appear against the smooth, ashen-gray bark of the old trunks. They are ovals, pointed and evenly

scalloped. The straight prominent veins on the under surfaces, running out to the very tips of the salient teeth, are drawn as with a rule. The arrangement of these ribs, however, is inclined to vary. In some specimens these nerves are opposite along the basal half of the midrib, but become alternate toward the point. Some are alternate at the base, but become opposite half way up, while on other leaves the ribs are alternate or opposite throughout the entire length.

The Dogwoods, or Cornels, too, are putting out. There is a peculiar physiognomy about the leaves of the species, though it can hardly be described, which at once shows to the observing rambler their Cornus blood. All of them have entire margins and are oval-shaped and pointed.

Along the swampy shore of a pond, where on one side rises abruptly a rocky slope studded with tall, straight Chestnut-trunks, I have paused to note a small tree among the boulders which is not very common in the northern and middle New England woods. It is the flowering Dogwood, *Cornus florida*, a big brother to the dwarf Bunch-berry. With the exception of its humble relative it is the only species here that has its flowers in close heads. These heads are surrounded by four large snow-white, corolla-like, heart-shaped leaves that appear some time before the little greenish yellow flowers open, and, when viewed amidst the young foliage or against the gray background of boles, ledges and the dead leaves of the forest-floor, present a very striking appearance. It is a notable example of those kinds of plants that throw out their signal flags to the honey gathering insects. It knows the importance of showy advertisement. Were it not for these conspicuous flyers the early bees and moths would pass them by unnoticed, and thus, by the neglect of cross fertilization, render the seeds and fruit less healthy and vigorous. But how quickly the leaf builders work. Before May has ended many of the leaves have attained their full growth and spread themselves along the branchlets in huge green flakes and slanting pinnacles that swing in the breeze as if they delighted in their luxuriousness; every shrub and tree yields foliage after its kind. There are patterns of hearts, rounds, ovals, spatells, spears and shields. Some are smooth and polished, others hairy and crimped, some with their edges entire or cut into hundreds of different pretty borders; each species of plant taking on the form, size and texture of leaf according to its "peculiar structure and organization, habits and requirements."

Boston, Mass.

Horace Lunt.

The Peruvian or American Potato.

THIS most important and valuable of the edible *Solanaceæ* is very erroneously denominated "Irish" in our census reports. Virginia has a certain claim to be considered the mother of the White Potato, but the vegetable in its present improved state owes more to its Peruvian and Chilian parentage than its Virginian. Much is also due to changes produced in the tuber by different climates and soils, which are in themselves a curious and interesting study. That our present Potato is a development from one wild ancestor having several sub-varieties marked by differences in the size and color of the tubers and in their habits of growth, has been established by experiments of recent years in our own country by the developing of a pea-sized tuber to one of a pound in weight in seven summers. The existence of sub-varieties will be learned by growing wild tubers from California, Texas, Arizona, Mexico, Peru and Chili, as has already been done in this vicinity by Mr. Burnet Landreth. It was discovered that the plants were generally white blossomed; some were dark green; others light green; some quite prostrate in growth, and others more erect; and what is quite important, that the Colorado beetle would not eat them. The tubers were yellow-fleshed, white-fleshed, oval, round and obovate.

The Peruvian Potato was first discovered in a growing state by the Spanish invaders of Peru, who saw it under cultivation in the vicinity of Quito. Peru, at that time, had an ocean frontage of about 2,500 miles, and included Ecuador, Peru as it is now, and a large part of Chili. The government was a theocracy and the people were devoted to agriculture; bringing water by aqueducts where required, using irrigation and fertilizing with guano, which then covered the coast islands until they were white and mound shaped. The birds producing this fertilizer came at certain seasons by the million and were protected by the government. Never, perhaps, was the terrace system of mountain agriculture brought to a greater degree of perfection or more extensively used by any people; and the sides of the Cordilleras were zoned with vegetation, varying in character according to the climate given by different degrees of elevation above the sea level. On these leveled

terraces the Peruvians cultivated at different heights the fruits of the tropics, the Indian Corn and the "Papas," or Potato. How long the Papas had been redeemed from its wild state it is impossible now to determine; but it will answer our purpose to know that the tuber grows abundantly over a long range of the Pacific slope, and that it can be acclimated and perfected by a few years of cultivation. The character of the wild Peruvian Potato was tested in 1828 by a party of officers attached to the United States frigate "Brandywine," as recently related to me by Dr. W. S. W. Ruschenberger, U. S. N. The vessel was lying in the Port of Callao, and the party visited the island of San Lorenzo, about a mile and a half from the town, climbed its declivity to an elevation of about 1,200 feet, dug up a quantity of wild potatoes, carried them aboard ship and had them cooked. They were found bitter to the taste and much inferior to the tubers perfected by cultivation. These wild potatoes were larger than those usually found in North America, which are rarely beyond the size of marbles. They were from two to two and a quarter inches long, of a flattened ovoid form and indented with eyes. San Lorenzo is a barren island about seven miles long and three-fourths of a mile wide, and rises to an elevation of about 1,400 feet. The Potato plants were dwarfed resemblances of their cultivated and improved descendants. Would it not be well to obtain and grow some of the potatoes of this island for hybridization with our more delicate varieties?

The Peruvian Potato was first carried from its native soil to Spain by Hieronymus Cardan. Pedro de Cieca, of Leon, published at Antwerp in 1554 an account of his seventeen years of life and adventures in Peru, in which he states that the Potato was at that time grown in Italy. Carolus Clusius, of Aras, a physician and botanist, wrote in 1583 that the Potato was then extensively cultivated in Italy. The tuber was therefore under cultivation in southern Europe long before it reached England from Virginia, and was grown in Spain as early as the year 1550.

Early navigators found the Potato under cultivation by the Indians of Virginia, by whom it was called the "Openawk;" this was, no doubt, a North American variety disseminated by the Indian tribe. Mr. Thomas Hariot, a member of the colony sent out by Sir Walter Raleigh to Virginia in 1585, is credited with having taken the first potato over to England in 1586, in a vessel commanded by Sir Richard Grenville. Mr. Hariot was a man of education, and devoted his attention to making discoveries and observations regarding the country, its commodities, and the nature and manners of its inhabitants, which he described in a book published in 1588. The potatoes he took over were given to Sir Walter Raleigh, who had them planted in his estate near Cork, Ireland, probably in 1587. The Potato was not cultivated in the United States by foreign settlers directly from Virginia tubers, but from Irish and Spanish stock, produced respectively from Virginian and Peruvian Potatoes. A colony of Scotch-Irish who settled in Londonderry, New Hampshire, in 1719, brought over and planted the former, and the latter were introduced at a later period, under the name of "Bilboas." These were larger, and were known in Pennsylvania as "Spanish Potatoes"; they had a pungent taste and odor, and neither variety was at all popular. The Irish stock was a small, bright yellow kidney tuber, a decided improvement upon the wild variety, but less so than the best potato of to-day is an improvement upon it.

The botanical name of the Potato plant was first given it in 1596 by Professor Caspar Bauhin, in his "Prodromos Theatri Botanici," in which he called it the "*Solanum tuberosum esculentum*." In England it bore the title of the "Virginian or American Potato." The first picture of the plant appeared in the "Herbal" of John Gerarde, surgeon, in 1597, under the title of "*Papus orbiculatus*." Gerarde had a large botanic garden in Holborn, London, one of the first of the kind in Europe, in which he grew both white and sweet Potatoes. The latter appear also in his "Herbal" as the "*Sisarum Peruvianum*, or *Batata Hispanorum*."

White potatoes were of slow introduction in the United States, partly from their taste, but more from an idea among working people that they were a slow poison, and that their daily use would prove fatal to the consumer in about five years. This erroneous notion was prevalent for a number of years, until it was finally broken up by the example of educated and wiser people. Had the potato of a hundred and fifty years ago been as inviting to the palate as is that of to-day, the poison idea would have had but little weight. There is a curious inconsistency in the human race with regard to the fear of poisonous articles. The potato, the tomato and the egg plant were all, in their early days, suspected of being poisonous, and this groundless idea was enough to keep many people

from eating them; but why did not the same persons take alarm at the poison of whisky, tobacco, opium and other liquids and solids not necessary to health and unquestionably containing a poisonous excitant? At the very period when the prejudice against the potato was the most active in this city, the Grand Jury reported that the places where intoxicating drinks were sold were nearly equal to one-tenth of the houses in the town. The craving for excipients knows no fear of consequences; while, at the same time, the desire for food is discriminating and suspicious.—*From a paper read before the Pennsylvania Horticultural Society, by Robert P. Harris, M.D.*

Plant Note.

Cattleya Skinneri.

THE illustration on page 201 represents a large specimen of this beautiful *Cattleya*, from a photograph taken in its native country by the collector, when more than 800 flowers were fully expanded, with a number of buds to open. Owing to its enormous size, it was with considerable difficulty brought to the place where the picture was taken, and a number of flowers were unavoidably sacrificed. The plant was afterward packed and shipped to Europe, and perhaps it still occupies a place in one of the Orchid collections on the continent. A still larger plant of this species was imported by Mr. Sander some years ago from South America, where it had been grown in a tree near the dwelling-house of a laborer. This giant Orchid, which was figured in the *Gardeners' Chronicle* for March 8th, was so large that a special house was built for its reception. In its native country the finest and most vigorous plants are found upon rocks, in positions where very little moisture stands about them, and the blossoms are then much brighter in color and of greater substance than when the plants grow upon trees and are partly shaded. There is very little variation found in this species, the rarest form being pure white; and this form is hardly ever found in a wild state; the plants that are now under cultivation in our collections are nearly, if not all, obtained from the roofs of native huts and from gardens in Costa Rica, where they are grown exclusively for the flowers, used to adorn the churches during the "Semana Santa," or Easter week. Like the majority of *Cattleyas*, this species delights in an abundance of air while growing, and if placed in baskets so that the compost may be fully exposed to the air and be in no danger of becoming sour or stagnant, it will grow vigorously. This compost should consist of good fibrous peat with a small portion of sphagnum.

Summit, N. J.

A. Dimmock.

Foreign Correspondence.

Berlin Letter.

AT the last meeting of the Society for the Advancement of Horticulture the exhibition of forced Roses attracted much attention. These were grown from cuttings made late in March last year. Plants of La France and Marie Baumann about two feet in height bore from twenty to thirty-six buds and flowers of extraordinary health and vigor and of greater solidity than is usually seen in grafted plants. These cuttings were from forced plants, and, as soon as rooted, they were planted out in the open air in April in a bed thoroughly enriched with well rotted manure and deeply spaded. During the summer frequent applications of liquid manure were given. In November they were potted and brought into a cold house, where they remained until February, when the forcing began. It is well to note that no pruning was done; not a twig that was grown during the summer had been removed. The bushes had a diameter of from two to two and a half feet, and the leaves and flowers were of the best quality.

Another feature of interest in this exhibition were the hybrids of *Saxifraga Stracheyi* and its allies, with pure white, rose colored and red flowers, those of one plant closely resembling Peach-blossoms, not only in size but in form and color. The plants had been placed in a rather dark position, in order to elongate the peduncles, which are normally short.

On page 90 of this volume of GARDEN AND FOREST I stated that plants of *Chamaerops excelsa* were to be left out all winter in order to test their hardiness, and the result has been that they have passed through in good health. Perhaps, therefore, these Palms deserve the distinction of having survived a European winter in the open air in a higher latitude than any others. It is true that the last winter was mild, the lowest temperature being eight degrees Fahrenheit, and yet the fact is of the highest interest and invites farther experiment. To make such

experiments most valuable it would be necessary to test Palms which have been grown from seed from the most northern limits or from the highest elevation where the species is ever found.

The temperature in March was extremely high—eighteen degrees of Fahrenheit above the normal. One day the normal temperature of June 15th was attained, and, as a consequence of the excessive warmth, spring flowers were so ambitious and the development of the leaves of trees and shrubs so rapid that spring here resembled those of the high north. One was greatly reminded of the season at St. Petersburg, where the spring runs its entire course in a few days.

Amongst the shrubs the white and fragrant flowers of *Lonicera fragrantissima* are already open in the botanical garden, and near it are seen the rose colored flowers of *L. Standishii*. Near these two plants stands the lovely *L. Alberti* from Turkistan. When I ran over not long ago the species of *Lonicera* in the Royal Herbarium I discovered that this Honeysuckle had before been collected by Schlagintweit in the Himalaya, in whose herbarium it is preserved without a name,

the nurserymen yielded the points in dispute. There are in and near Berlin some 500 nurserymen, who employ some 2,000 gardeners.

I should be greatly obliged if some of your western readers would collect for me some seeds of *Erigonums*. These plants are well suited for culture here, especially on rockeries, but they are found in few European gardens. Their inflorescences are of the highest morphological interest, and I should like to study their development, but to do it I need the living plants.

Berlin.

Udo Dammer.

Cultural Department.

Hardy Rhododendrons.

IT has been suggested that the experience of an old grower and lover of Rhododendrons might prove of interest and possibly help to promote the cultivation of these beautiful shrubs, and I therefore send a few notes of a general character, based upon many years of labor and careful observation.

It must be admitted that the cultivation of the Rhododendron



Fig. 35.—*Cattleya Skinneri*.—See page 200.

and now Dr. Koehne, who is elaborating a revision of *Loniceras*, finds that *L. Alberti* of Regel is a long known plant, *L. spinosa*, Jacq. *Corylopsis spicata*, S. & F., allied to the Witch Hazel, is another plant now flowering in the botanical garden, and very beautiful it is and well worth growing in any park or garden. Forsythias have become most popular here of late years, and there is hardly a cottage-garden in which there is not at least one of these shrubs covered now with its bright yellow flowers. It is specially adapted to our climate.

The strike of the under-gardeners was begun on the 1st of April, although it had been in preparation since last autumn. At that time the gardeners demanded of the nurserymen a change in their working hours, which was refused. This spring they sent a demand to the nurserymen that their working time in vegetable and plant nurseries should be eleven hours, while in tree nurseries and out-door garden work it should be ten hours, and that their minimum pay should be \$6 a month with board and lodging, or \$4.28 a week without board. Most of the nurserymen declared that those demands were not exorbitant, and yet they refused to subscribe to the terms, so the strike began. It seems, however, that at the last hour

in this country has made comparatively slow progress, in spite of liberal prizes offered by our horticultural societies and the high appreciation in which the plant is held in England, where it is a prominent feature in the decoration of all the fine places and where those grand exhibitions under canvas excite so much interest and admiration every year. The explanation of this indifference is found to some extent in a general impression, in New England especially, that our winters are too severe, or that the Rhododendron is so difficult of cultivation that only a few can succeed with it, and then only at the cost of much labor and money. That there is some foundation for this belief cannot be denied, and it is true that the mild and moist atmosphere of England is better adapted to its special requirements than the extreme cold winters and the hot, dry summers of this country. It is true also that many of the very finest varieties can be grown there which are tender here. But, on the other hand, it is equally true that a sufficient number of very attractive hardy kinds remain to satisfy the most ambitious horticulturist, and these, under favorable circumstances, can be grown here without much more care than is given to ordinary garden shrubs.

It should be more generally known that the list of well tested hardy kinds has been largely increased of late years, thanks to some of the skillful hybridizers in England, who have raised new varieties for this country with special reference to their hardiness combined with splendid foliage and the most gorgeous flowers. Enterprising nurserymen on this side of the water have also accomplished much in this direction, and it is to be hoped they will be repaid for their trouble and expense. To show what progress has been made in the introduction of new and choice varieties, I can testify that it is not a great many years ago when but very few of the bright flowering varieties termed precariously hardy were to be seen here; and I remember hearing the statement made by one of our most intelligent horticulturists that not one of them could be considered perfectly reliable in our most severe New England winters. All doubt, however, on this point has been entirely removed at the present day, for we have numerous fine crimsons and scarlets, many of which have proved as hardy and reliable as the old favorite *Everestianum*.

In the cultivation of *Rhododendrons*, a mistake is frequently made in selecting for them the most sheltered southern exposure that can be found and one where the sun shines on them the whole day, under the impression that they are all extremely tender. In such a location the soil is likely to become very dry and parched in midsummer, and the result is that the plants suffer from drought, which, together with poor cultivation, in my judgment causes more injury than our most severe winters. As is well known, the *Rhododendron* requires a cool and moist soil, and it is sure to suffer the moment the roots become dry, though the injury may not be apparent to the casual observer at the moment. The latter part of the winter, however, tells the tale in the browned foliage and then the injury is often wrongly attributed to the cold weather. The bad effect of drought is also occasionally seen in the spring in dead flower buds which have never fully ripened. For many years I thought extreme cold weather was the cause, but with closer investigation I have concluded it is oftener owing to very dry weather, and I am confirmed in the opinion by the fact that this rarely occurs except after an unusually dry summer. This objection, however, of selecting a southern exposure for planting will not apply with the same force in cases where the place is a reclaimed meadow or has a soil which keeps moist even in very hot weather; but these are conditions not very often met with; and I would recommend as far as practicable that plantations be made on the northern slope of hills, or where they will be shaded during some portion of the day by belts of trees or buildings.

After what has been said in regard to the great importance of moisture in the cultivation of *Rhododendrons*, it follows as a matter of course that a careful and thorough preparation of the soil in making borders for plantations is a necessity. Two or three feet of loam may answer for ordinary shrubs, but twice that depth is better for *Rhododendrons*, especially when they attain considerable size. It is now generally understood that peat is not indispensable, still it is highly beneficial, and I would confidently advise its liberal use when easily obtained, as well as a good supply of leaf mould, which I believe to be equally desirable.

The hybrids of *R. Catawbiense*, which are the most hardy in constitution, and from which by crossing the finest crimson and scarlet varieties are produced, have been sent out from England during the last dozen or fifteen years in large quantities, and varying as they all do in respect to hardiness, it has been no easy matter to ascertain with certainty which could be depended upon in our severe and changeable climate. An inspection of the foliage is generally a very sure guide, but it is not conclusive, and many cases of so doubtful a character occur that it is necessary, before a positive decision is reached, that they should be left out for several winters in order to settle this question satisfactorily. There are, however, many of these new and charming varieties which have been so thoroughly tested that they can be confidently recommended for general cultivation in this part of the country. One of these which is a favorite with many is *Lady Armstrong*, a pale rose, spotted and showy, with good habit and foliage. Others are *Scipio*, *Giganteum* and *Sherwoodianum*—all rose colored—and *Charles Bagley*, cherry red, with extra fine foliage. Among the crimsons we have quite a number which are great acquisitions to the hardy list and must soon find their way into all collections. *Mrs. Milner*, a rich crimson, I have had out many years. *Kettledrum* has proved very satisfactory, and so has *E. S. Rand*, which has been somewhat lost sight of. *H. W. Sargent* is a grand crimson, with an immense truss, but it has proved a little disappointing in habit. *Guido*, crimson; *James Bateman*; *Lady Clermont*, rosy scarlet and very desirable;

Caractacus, a rich purple-crimson, and *Old Port*, plum color, are all good. *Alexander Dancer* can be strongly recommended as of good habit and foliage, with a grand truss of bright rose flowers. *Minnie*, bluish white, spotted with chocolate; *Charles Dickens*, very hardy, dark scarlet; *John Waterer*, a free blooming dark crimson; *Mrs. Thomas Wain*, pale rose, and *Maximum Wellesianum*, blush, changing to white, with fine foliage, can also be safely recommended.

I now come to some of the still more recent and choice English varieties, which for several years I treated as half-hardy, moving them into pits in the autumn, where they remained during the winter. This mode of treatment not proving an entire success, I have been testing many of them by leaving them out in the borders all winter, some for several years and others only during the past two years, with very encouraging results, though it will be remembered that both summers and winters of the past two years have been exceptionally favorable for *Rhododendrons*. Still the thermometer at Wellesley has been down to five degrees below zero once, and twice to zero this last winter. They are magnificent plants with flowers of great beauty, and my experience with them, though limited to a few years, has been so very promising that I think they can be recommended to any one disposed to give a little extra attention to favorite plants.

J. Marshall Brooks is a rich scarlet, with a bronze spot, distinct and beautiful; *J. McIntosh*, a rosy scarlet; *F. D. Godman*, crimson, fine foliage; *Ralph Saunders*, purplish crimson, large truss; *Rosabel*, pale rose; *Lady Grey Egerton*, silvery blush, splendid truss and foliage. *C. S. Sargent* is one of the finest crimsons, and with its *Catawbiense* foliage will doubtless stand any old-fashioned New England winter. The Queen has a fine shaped flower, blush changing to white. *Mrs. Arthur Hunnewell* is pink with primrose centre, very showy and promising. *Mrs. John Clutten* comes with the recommendation of being the best hardy white *Rhododendron* in cultivation; I have at times felt discouraged in regard to its success in this part of the country, but with some coaxing have finally succeeded in raising some fine, good sized plants. Other noteworthy varieties are *Joseph Whitworth*, dark purple lake, large blooms, beautiful foliage; *Duchess of Edinburgh*, crimson, with light centre; *Duchess of Sutherland*, white, with margin of rosy lilac; *Duchess of Bedford*, crimson, light centre; *Marchioness of Lansdowne*, pale rose, with intense black spot, very showy; *Charles Napier*, clear rose; *Mrs. Shuttleworth*, scarlet, much spotted, and a very free bloomer; *Sigismund Rucker*, magenta; *William Austin*, bright crimson, abundant bloomer; *Meteor*, fiery crimson; *Sir Arthur Guinness*, fine clear rose; *Bacchus*, crimson, large truss; *Ne Plus Ultra*, finely shaded lilac-purple, good foliage.

Here is a list of over twenty very beautiful varieties supposed by me for many years to be tender in this vicinity, but I now believe a large portion of them certainly will be found hardy and great acquisitions to any collection. They, however, must be well cared for, and if water is not abundant and easily applied, they must be thoroughly mulched with some suitable material, or they will surely suffer from our hot and dry summers. I use for this purpose large quantities of forest-leaves, which are effectual, and when decayed make excellent nutriment for the plants. The objection that they are not very neat is easily met by a good covering of Pine needles.

I will here add to what has already been said on the importance of selecting a location where the plants will be shaded from the mid-day sun, that it is a precaution particularly desirable with these very choice and distinct varieties for the reason that if the weather happens to be very hot at the moment they come into bloom, the length of time the brilliant flowers remain in perfection is shortened very materially.

Wellesley, Mass.

H. H. Hunnewell.

Notes from the Harvard Botanic Garden.

FRANCISEA EXIMIA AND *F. LATIFOLIA*.—Both these fine old Brazilian plants are now flowering freely in a stove temperature. The former is an evergreen shrub of bushy habit, with lanceolate leaves, dark green on the upper surface and paler underneath. The salver-shaped flowers are borne upon the tips of the young shoots, and measure almost two and a half inches across. They are of a rich purple color, with a white eye when first expanded, but afterward shade off to a beautiful lilac tint. It is certainly a handsome and most desirable plant when in full bloom. Specimens that are satisfactory as to form may be potted immediately after flowering, but those of ungainly appearance had better be pruned into shape and allowed time to break slightly first. Sharp sand, leaf-mould, peat and loam, in equal parts, the two latter being

fibrous and lumpy, will form the most satisfactory soil. They should be placed in a moist atmosphere after potting, and where a minimum temperature of sixty degrees is maintained. Syringe regularly, shade from prolonged bright sunshine, and water carefully until new growth appears freely. Water in abundance will be required during the period of growth, and the plants should then be placed as close to the glass as may be convenient. When the young shoots attain a length of about three inches pinch out the extreme tips, but do not continue this process beyond the latter part of September; and a month later remove the plants to quarters that are drier and from ten to fifteen degrees cooler. Full exposure to sunshine will now be beneficial; less water will suffice, though the roots should never be subjected to extreme dryness, and, as the flowers appear, syringing may be discontinued. Firm cuttings of the young wood, taken with a heel of an older branch, root freely in sandy soil, with strong bottom heat, moist atmosphere and shade. In general outline and in the character of its cultural requirements *F. latifolia* closely resembles *F. eximia*. The leaves, however, are obovate, while the smaller flowers are deliciously fragrant, and of a distinct blue

position), and the others diminish in size as they approach its extremity. The plant is tolerably tenacious of life, but special attention to its cultural requirements will be amply repaid. Repotting as soon after the flowering season as possible and abundance of heat and moisture, with shade from bright sunshine during the growing season, are the principal matters to receive attention. It thrives admirably in a mixture composed of two parts each of turfy loam and fibrous peat to one each of sand, leaf-mould and manure, the two latter being thoroughly decomposed. In the case of extra large specimens some rough charcoal may be added. A minimum temperature of sixty-five degrees should be maintained during the season of growth, and afterward gradually lowered about ten degrees. Plants that are continually kept in a high temperature flower about three months in advance of those that have been subjected to less heat after the growth has been completed; but their inflorescence is usually inferior, and eventually the plants become exhausted. It is due to the pressing demands on space in a botanic garden that the only specimen here is kept in a growing temperature throughout the year, and generally blooms early in March; under more rational



A Road in Sherwood Forest.—See page 197.

shade, with a prominent white eye, when they open, but in process of time the entire flower becomes pure white. It is a common thing to see at the same time blue, lilac and white flowers on one branch of the same plant.

MEDINILLA MAGNIFICA.—It would be difficult to find a more truly magnificent object than a well grown specimen of this plant in full bloom, and, being an evergreen, the massive foliage renders it strikingly ornamental at all seasons. It is a branching shrub of somewhat scandent habit, and attains a height of five or six feet. The stems, when young, are flattened, green and smooth, but become gradually cylindrical, rough and brown; and they are well furnished with leathery, obovate, glossy green leaves from twelve to fourteen inches long and about six inches broad. The whorled terminal panicles of bright pink flowers average about twelve inches in length, and they assume a drooping position which adds materially to their pleasing effect. Showy bracts of a delicate pink color, disposed in opposite pairs or whorls of four, also contribute largely to their beauty. The largest of these bracts—they often exceed five inches in length by four inches across—are at the top of the inflorescence (when it is in a drooping

treatment the flowering season would extend from the beginning of April till the latter end of May. It is, however, very accommodating in this matter, for by the steady maintenance of a maximum temperature of sixty degrees, after the growing period, the bloom may be retarded to almost any season of the year. It will thus be seen that a growing temperature is, in this instance, as requisite to the development of flowers as it is to the production of new branches; and, seeing that new growth makes its appearance soon after the flowers are shed, this is just what might be expected. It can be propagated by cuttings prepared from the growing points of young shoots.

SPARMANNIA AFRICANA.—This handsome evergreen shrub is a native of the Cape of Good Hope, and attains a height of ten or twelve feet under cultivation. It is of branching habit, and the branches are furnished with cordate-acuminate, dentate, light green leaves, which measure from four to five inches in length, and from three to four inches in width. Sometimes the leaves are lobed toward the apex. The pretty white flowers are freely borne in umbels, on the young branches, during spring. The numerous stamens,

with red filaments and yellow anthers, form a showy mass in the centre of each flower, and a series of barren yellow filaments, arranged round the fertile stamens, also adds to their good appearance. The branches and leaves and exterior surface of the sepals are clothed with downy hairs. *S. Africana* gives perfect satisfaction in an ordinary greenhouse, the temperature of which never falls below thirty-five degrees. Full exposure to light is at all times requisite, and a free circulation of fresh air on favorable occasions is beneficial. Specimens of all sizes will derive considerable advantage from being plunged to the rim in the open garden during the summer months, and when dry weather prevails a syringing toward evening will add to their healthful appearance. Plants should be potted early in spring. The tips of the young shoots root readily in a propagating frame at a temperature of about sixty degrees.

SOLANUM JASMINOIDES.—From a floricultural point of view this is perhaps the most useful and beautiful species of the genus to which it belongs. It is a native of South American countries, but succeeds satisfactorily in a green-house, the temperature of which never falls below forty degrees. Being of a climbing habit, it is seen to the greatest advantage when treated as a vine, and trained to walls, pillars or rafters. The younger branches then hang downward gracefully, and during winter and spring bear numerous racemose clusters of pretty white jasmine-like flowers, that are further adorned by conspicuous bunches of yellow stamens. It is a deciduous plant, the ovate-acuminate—sometimes cleft—leaves falling late in summer or early in autumn, and it grows most luxuriantly when planted in a prepared bed or border. When in active growth it requires plenty of water, but the quantity should be restricted during the season of rest, which continues from six to eight weeks after the leaves have dropped. The tips of firm young shoots make good cuttings, which root quickly in sand with the assistance of a little bottom-heat.

Cambridge, Mass.

M. Barker.

Wild Flowers under Cultivation.

EXPERIMENTS in the cultivation of wild plants often give results at once surprising and gratifying. The common Loosestrife (*Steironema ciliatum*), for example, is a plant which in its wild state attracts but little attention, and which but few persons will even recognize. A year or two ago I lifted a clod of its roots and gave it a position in my garden on the north side of a picket-fence and in the partial shade of a tree. The last summer it formed a charming mass of neat, clean foliage, borne on many erect, wiry, symmetrically branching stems three or four feet high, a cord tied to the fence affording a slight support, and when studded over with its airy, delicate, golden-hued blossoms, but few plants in my garden excited more interest or were more admired. It is, too, a lasting bloomer, and retains the freshness of its verdure until cut down by the frost.

Another plant that has especially pleased me under domestication is *Spiraea Aruncus*, or Goat's Beard. A clump among the shrubs in my garden is a most effective feature, making a luxuriant growth of a peculiarly picturesque habit, and the flower panicles produced are of immense proportions, the whole plant having improved wonderfully with the slight care it has received. During the early period of their growth, or until they are a foot high or more, specimens may be readily removed from their native haunts to the garden, and, in a rich soil, will thrive from the start. Care must be taken to discriminate between the male and female plants, only the former producing the large, showy flower-panicles. During the period mentioned I have never failed to separate the sexes by the marked reddish tinge of the stem and leaves of the female plants—a point which seems to me an interesting and noteworthy distinction. The foliage, however, of the female plant is more lasting, retaining its freshness until the seeds ripen, while in the male plant it begins to fade or dies soon after the flowers wither.

The Blue Wild Indigo (*Baptisia australis*), ornamental in flower and foliage, is an abundant strong-growing species along the shore of the Ohio River within my field of observation. A few years ago I transferred a specimen, with its remarkably deep set, strong and bulky roots, to my grounds, setting it in an open situation in a compact sandy soil. It flowered and did well the first season, but the next year or two it was less thrifty and failed wholly to bloom. One autumn I loosened the earth about its roots to the depth of eight or ten inches and covered it with two or three inches of well rotted manure. In the early spring I again loosened the soil and at times gave it a thorough soaking, letting it take in as much as a painfull. That season it made a remarkably vigorous growth,

and produced a number of strong racemes of beautiful flowers. These plants, in their natural state, grow in an alluvial or sandy soil, and are often submerged by a full river for days together, which also serves as a strong fertilizer. To attain the highest success in their cultivation I am persuaded these conditions must be largely imitated.

Every one is familiar with Jack-in-the-Pulpit, or the Indian Turnip, but there are but few, it is safe to say, who have any knowledge of its congener, the Green Dragon (*Arisæma dracontium*), a scarcely less interesting plant, less common, perhaps, and less conspicuous as it grows naturally, but by no means rare. It could well lay claim to the distinction of bearing one of the oddest or most grotesquely formed leaves (it has but one) among native American plants. A little imagination might see in it a dragon's foot and claws. Whether it was this that suggested it or the fiercely acrid juice of its root-stock, and that of its kind, the name given to the plant is singularly appropriate. A bulb or corm set in my garden half a dozen years ago grows uniformly a much larger leaf than I have ever seen it in its wild state, measuring last summer a little over a foot across, and with seventeen leaflets, instead of "seven to eleven," as given by the botanists. With its very odd leaf and remarkably long and slender orange colored spadix it well deserves a place in the wild garden as a curiosity. Its scarlet fruit cluster is no less brilliant than that of the Indian Turnip.

Another domesticated wild plant in my garden worthy to be mentioned here is the Goat's Rue (*Sephrosia Virginiana*). It is enough to say of it that it retains under its new conditions all of its natural attractions of showy flowers and pleasing foliage. Some have told me they have failed in their attempts to grow it. In its natural state here it grows its long slender roots in a dry slaty soil in a more or less sunny exposure. I have conformed somewhat to these conditions. These are a few of the experiments of a busy man who loves flowers with a few plants growing wild in this region. They are presented with the hope that others may be induced to make similar trials and share with him much pleasure and instruction.

Fairview, W. Va.

W. E. Hill.

Hardy Plants for Cut Flowers.—I.

FLOWERS for home decoration are now in universal demand, and this is one of the uses to which hardy perennial plants are specially adapted, because their requirements are few and they can be successfully cultivated by any one who can command a plot of ground. Of the thousands of perennial plants in cultivation, many whose flowers are beautiful, fragrant and durable when cut can be found adapted to any American garden, whatever may be its situation. It is now established beyond question that a selection of plants for the open border can be made to yield flowers in variety and profusion for nine months in the year, or from March until December.

Among the earliest of hardy subjects, the bulbous section take first rank. Such harbingers of spring as Squills, Chionodoxas and Crocus cannot be considered useful for cutting and it is on the numerous family of Narcissus that we most rely for the first really useful cut flowers. When Easter occurs well on in the season, as in the past two years, Narcissuses are always plentiful in the open air with us and can be relied upon for an abundance of flowers when they have become well established, which is usually the second year after planting. The varieties of Narcissus are numerous and naturally perplexing to the beginner, who is chiefly interested to know which are a few of the best kinds that will produce the longest succession of bloom. Out of a large collection, Golden Spur, one of the newer kinds, is always the first to bloom, followed a day or two later by *N. princeps*, a noble kind, and then comes Sir Watkin, the Giant Welsh Chalice-flower "with foliage like leeks," as Mr. Burbidge once observed when showing me his fine collection in Trinity College Gardens, Dublin. *N. bicolor Horsfieldi* then follows, and is at once the most distinct and beautiful variety in cultivation. The Jonquils should be added for their fragrance, and lastly, the beautiful Poet's Narcissus and its varieties. Thus it will be seen that some half dozen kinds, lasting over as many weeks, are to be relied on as perfectly hardy and vigorous, and are sufficient to form the nucleus of a collection that may be added to as opportunity occurs. It should be remarked that Narcissuses succeed well in shady places under trees, and may be used with charming effect for naturalizing among grass, many an English meadow being at the present time literally a garden of Daffodils. American cultivators need not trouble themselves about the necessity of lifting the bulbs annually after they have flowered, although this is practiced and preached

by some of the best English growers. We have always found that the greater extremes of drought and solar heat experienced here at the resting period of the bulbs will be found sufficient for ripening them, and that lifting them, besides the labor incurred, only produces artificial conditions which are unnecessary and too often detrimental.

Passaic, N. J.

E. O. Orpet.

Endive.

THIS is an excellent winter salad, resembling the Dandelion in habit of growth, and quickly grown from seed, which should be planted about June 15th, and for a succession at intervals until August 1st. Hot weather is unfavorable for bleaching the plant, and cool nights and days up to November are most favorable. The Green Curled gives the best satisfaction. The Moss Curled is too tender; the Batavian too coarse. Plant either in rows to be thinned, or in a bed for transplanting. It bears transplanting well, but will grow where sown if plants are thinned to one foot apart each way. It is a great feeder, and well repays good care. When about ten inches across the leaves should be gathered about the centre in an upright position and tied with cotton cord wound three or four times about the plant.

There are other methods of bleaching, but none so quick, sure and satisfactory as tying the plants as recommended here, and I have discarded all others. The bleaching is completed in ten days or three weeks, as the weather is warm or cold. The plants should then be lifted with a ball of earth and brought into a light, cold cellar in fall, and set on the bottom in sand, where they can be kept until New Year's or until wanted for use. The white, crisp, slightly brittle leaves are pleasant to the eye and the palate.

Endive is a plant for the home garden, where it can be grown as a second crop when transplanted after Peas, Beans or other early vegetables. It should have sunlight for good development, as it makes a small and infirm growth in shade.

West Springfield, Mass.

W. H. Bull.

Where to Plant Tender Trees.—A beautiful and thrifty Deodar Cedar, growing on a rocky, elevated site, suggests the thought that many partly tender trees might be grown if planted in situations where strong or late growth would not be made. The tree above referred to has made little growth each year, but this was sturdy and well ripened. It did not appear to have suffered at all in any of the severe winters through which it has passed. Many trees of doubtful hardiness would thrive under the same treatment. A few years ago I saw a fine specimen of *Magnolia grandiflora* growing on the hills of Roxborough, the coldest and highest part of Philadelphia. There was no protection save that of a dwelling, which was on the north side of it. It is well known that Peach and Apricot-trees growing in hilly places are rarely killed back in winter, as many are in rich, low ground.

Germantown, Pa.

Joseph Meehan.

Hybrid Perpetual Roses.—If I were asked to name twenty of the best hardy Roses for out-door planting my list would be the following: Jean Liabaud, Paul Neyron, Mrs. John Laing, Ella Gordon, General Jacqueminot, General Washington, Alfred Colomb, Comte de Paris, Beauty of Waltham, Gloire de Margottin, John Hopper, Madame Charles Wood, Marie Baumann, Madame Masson, Madame Joseph Desbois, Queen of Autumn, Ulrich Brunner, Jules Margottin, Lady Helen Stuart and Eugene Furst.

These are all plants of strong constitution and produce magnificent blooms. The collection contains all the range of colors found in the Hybrid Perpetual class, from the light flesh tint of Madame Joseph Desbois to the velvety crimson of Jean Liabaud.

Richmond, Ind.

E. G. Hill.

Triteleia uniflora.—This charming little bulbous plant is a native of Buenos Ayres, but it is quite hardy in the New England States, where its pretty star-like flowers are freely produced late in spring. They are borne singly on slender stalks, well above the somewhat drooping linear-acuminate leaves, which measure about one-eighth of an inch in width and from five to seven inches in length. The flowers are about an inch in diameter and of a delicate lilac color when they expand, fading with age to pure white on the upper surface. For a cool house it is a very effective pot plant during winter and early spring, and with a little extra care it may be induced to flower from the latter part of fall onward. In pot culture about a dozen bulbs should be planted—in a six-inch pot, using rich sandy soil—in September, and placed in a shaded and unheated frame, where, with attention to watering,

the free admission of air on favorable days and protection from severe frost, they may remain until about two weeks before they are wanted to bloom. On removal to a sunny greenhouse, which affords sufficient artificial heat to exclude frost, the flowers will speedily develop. By attention to the offsets, which are freely produced every year, the stock of bulbs may be rapidly increased. They should be planted in the garden and allowed to attain full size before being used for pot culture.

Cambridge, Mass.

B.

Recent Publications.

The Forests of North America.—II.

Die Waldungen von Nordamerika, ihre Holzarten, deren Anbaufähigkeit und forstlicher Werth für Europa im Allgemeinen und Deutschland insbesondere. Von Dr. Heinrich Mayr. M. Rieger, München, 1890 (New York, Steiger & Co., 25 Park Place).

It is in the description of individual species and their products that Dr. Mayr's learning and conscientiousness most strikingly appear. For instance, his words about the Douglas Spruce (*Pseudotsuga taxifolia*), just now the most interesting of our trees to foreign foresters, fill more than twenty pages. Its aspect as a feature in our western forests and the methods employed in cutting it and transporting the wood are described in the chapter devoted to these forests. Then, in the section where each species is separately taken up, he describes its botanical characteristics and mode of development; its behavior under different conditions of climate, exposure and soil is carefully noted and illustrated by comparative tables of figures; the anatomical characteristics of the wood are exhaustively discussed and tables are given comparing it with the wood of the European Fir, Spruce and Larch; and its parasitical enemies and their action are considered, the adaptability of the tree to German forest-needs being of course borne in mind throughout. And then, in the chapter where the fitness of our trees to European conditions is especially discussed, he comes back again to the Douglasia (as it is called in Germany), and defines the stations which should suit it best and the value it will probably have. "It is to be expected," he says, "that the Douglasia, in so far as the excellence of its wood is concerned, will become the 'Larch of the level and low lands.'" When its wood is richest in substance and heaviest, it comes near to that of the European Larch; when it is lightest it stands on an equality with the best and heaviest Fir, Spruce and Pine-wood. "As the value of wood for fuel and to a certain degree its strength run parallel with its specific weight, the wood of the Douglasia may be called superior to that of our native conifers (the Larch excepted) in these qualities." Specific weight, he adds, is less decisive with regard to durability, but from the other factors which indicate this quality he concludes that "in this respect likewise the Douglas Spruce stands on an equality with the Larch." It is interesting to note that on comparing the wood of this tree as supplied by a specimen grown near Hanburg, in Germany, which was cut in 1882 at the age of fifty-two years, having remained remarkably low in a fully exposed situation, with the wood of a three-hundred-year-old specimen from Oregon, he found the former heavier and firmer in substance. The very best European stations for the tree he decides to be the north-west coast of France, and then Belgium, Holland and southern England, while neighboring districts, like Ireland, Scotland, and those portions of Germany which are directly influenced by the North Sea and the western Baltic, should prove almost as good, and its range may be extended, as far as climate is concerned, throughout the whole of Germany except its highest mountain regions. But he is careful to note that for each given district seeds should be imported from the proper American region, those trees grown from seed collected in Montana being proof against frost but slow-growing, while those from Oregon and Washington are quick-growing, but susceptible to spring and autumn frosts. Seeds from Colorado, he adds, which are recommended by dealers as giving frost-proof trees for our Eastern States, are not adapted to German use. "The plants are hardy, it is true, but very slow-growing indeed."

Dr. Mayr is careful to point out that the question whether an exotic tree can be grown in a given part of Europe is by no means the same as the question whether it will there serve the purpose of the economic planter. It does not fall within his province to discuss the value of such trees for park or street planting, or as objects of beauty or interest in ornamental grounds. He concentrates his attention upon their ascertained or possible serviceableness in the economic forest,

where, of course, they will be expected not merely to exist or to become objects of beauty, but to support forest-conditions, to grow at least as rapidly as indigenous species, and to produce wood which is at least equal to that which these species supply. Of course, the subject is a complicated one, and with most of our trees much actual experimenting must still be done before their worth to European foresters can be estimated. But whatever can be done by theorizing, based on a wide and careful observation of facts in this country and a thorough acquaintance with European conditions, seems to have been done in this volume. The danger of generalizing from too brief experiments is made clear, and is emphasized by reference to many European species which, for a time, seem to do thoroughly well in America, but before they reach maturity fail and die. The same thing, says Dr. Mayr, may be expected in many cases in Europe—a quicker growth to begin with than is shown by related native trees and then a sudden and hopeless failure. The reasons for this phenomenon are of course referred to, but at a length too great to permit quotation now. It is especially interesting to follow the author through the chapters where he discusses the different elements which are comprised under the general term location. Relative degrees of cold constitute of course only one element, and the significance of this one is modified by the character of the others, as by the greater dryness or moisture of the atmosphere or of the soil, or a greater or smaller degree of evaporation in the plants themselves as affected by particular situations. "Nine-tenths," Dr. Mayr explains, "of all cases in which injury through frost in winter is affirmed, belong in the category of injury from drought, the consequence of a hindered or diminished water-supply brought about by frost. In this way, perhaps, may be explained the apparent paradox that many species which are known as 'hardy' in a notoriously cold climate pass for 'tender' in a notoriously mild one. Probably the plants stood in the first locality in a moister atmosphere or were better protected against evaporation, while the susceptible plants in the warmer locality had to fight against dryness and frost. It is to be expected that all species which come from the warm coast-zone, delight in swampy stations and live associated in large forest-masses will be particularly susceptible to a combination of frost and dryness. At the head of the North American species which come thus in question stand the conifers of the Pacific Coast west of the Cascade Mountains. In order to cultivate these in Europe without loss through frost it seems as though only the coasts, the interior of large forests, damp river and mountain valleys, or even a damper subsoil than they require at home, will be found available. The Lawson's Cypress, the Douglas Spruce, the Giant Hemlock, the Sitka Spruce and the Nutka Cypress are entirely hardy under these conditions; but if they are lacking, then even the Sitka Spruce fails, which, in its own home, on the shore of Alaska, stretches almost to the glaciers. Each plant, indeed, possesses a certain adaptability to changed conditions with regard to moisture, which may be increased or diminished by the dampness of the air and by the dampness of the soil, each by itself or both working together. The plant reacts notably against this combination in varying ways. Researches upon this point are not known to me. It is true that I now lack the literature to search with regard to it, and the contributions which I shall bring to the support of the statement rest, therefore, on my few personal observations. But if a literature on this subject does indeed exist, it cannot be very large, for the moisture of the air as a weighty factor in plant life has as yet not been sufficiently recognized." We cannot follow Dr. Mayr into the analysis which he then gives; but it seems worth while to call attention to the words last quoted as indicating a profitable field for other students.

Interesting, too, are his notes on the dangers which American trees will probably run in Europe from animal and vegetable enemies. He doubts whether they will be freer from such dangers than native plants. Indeed, he notes a number of probable special sources of danger, from the love of men to break off vital bits of new and interesting specimens, to the delight which, for some unexplained reason, all animals seem to find in exotic kinds of food. Again, epidemic diseases are more apt to afflict trees when many of a given kind are massed together (as is usual in economic planting) than when they are mixed with other species in the primeval forest.

But it would be an almost endless task to pick out all the most interesting and instructive passages in this book. We do not profess even to have called attention to some of those which, above all others, merited notice. To accomplish this one would have to read the volume more than once, and carefully weigh the relative significance of all its parts. Desiring to bring it as quickly as possible to the notice of our readers,

we have simply chosen passages here and there for their illustrative value as showing the field it covers. Meanwhile we must conclude with a brief mention of the scheme for the use of our trees in Germany, which is outlined in Section XI.

Repeated stress is laid on the fact that little can be settled with regard to the economic value of our trees until they are tested in the forest itself, where, naturally, they often do better than in isolation. Dr. Mayr recommends, therefore, that small colonies of a given species shall be formed in forests which already exist, and all due measures taken for their protection and for observing their development. Then he mentions many American trees which are well worth using or testing, explaining his special reasons in each case. And then he fixes the limits of five distinct zones into which German lands may be divided according to general climatic conditions, and gives from one to three lists of plants for each of them. The first list contains those trees which have already been thoroughly tested, the economic value of which is established, and which therefore should be added to the small list of species now used by the forester, and planted in large masses. In the second list he places trees which are evidently valuable, which give good promise of adaptability to German conditions, and which it is, therefore, worth while to test in an extensive way; and the third indicates less valuable species which likewise have not yet been thoroughly tested. For example, the first zone he defines includes "the warmest, lowest regions of Germany, the valleys of the Rhine, the lower Main and the Neckar, with a medium yearly temperature above nine degrees Centigrade and a medium temperature during the period of most rapid growth of over seventeen degrees, where the Oaks do best, the Chestnut regularly ripens its fruit, and the cultivation of the Vine, of Tobacco and of Maize is possible." For this region he indicates, in Class I., the Black Walnut, the Shell-bark, the Pig-nut and the Mockernut Hickories, and the Sugar Maple; in Class II., the Black and the Yellow Birch, the Red Cedar, Lawson's Cypress and the Douglas Spruce; and in Class III., the Black Cherry, the Catalpa, the Occidental Plane, the American Elm, the Locust, and three Poplars, *P. balsamifera*, *P. monilifera* and *P. trichocarpa*. It may be noted that as a shrub which may cover the forest-soil and yield a valuable by-product in its fruit, Dr. Mayr recommends *Vaccinium macrocarpum*, from its fitness for ground upon which wood-production, even if possible, is, at all events, of minor importance.

Correspondence.

Botanical Names.

To the Editor of GARDEN AND FOREST:

Sir.—I often hear the remark: "If it were not for the hard names of the plants, how I would like to study botany, but I know I never could remember them." This too prevalent idea with the young is largely due to the "wits" who hold up botany and kindred sciences to ridicule by selecting some of the most difficult and uncouth names and making them the text for so-called humorous paragraphs in the daily papers. These articles are funny, no doubt, or they would scarcely find a place in our great dailies, and yet the more witty their railery the more damaging the influence.

But occasionally we see an article, apparently written in all seriousness, to deplore the use of scientific names. As a case in point, I quote from a newspaper article: "True, my reading is mostly in history and literature, but that is not because of my indifference to science, which I regard as the highest of all truth, but because of the horrible jargon in which science is concealed rather than revealed. A rose by any other name may smell as sweet, but it does not sound as well when called an *Anastatica hierochuntina*. . . . I went to a flower show a short time since and saw the common Smilax labeled *Myrsiphyllum asparagoides*, and a Primrose marked *Primula Sinensis fimbriata*, and I thought of Wordsworth's

'A Primrose by the river's brim,
A Primrose only was to him,'

and how his soul would have expanded if he had only known that other name. Now I confess this is all Greek to me, and I want to know if it is a help or a hindrance to the acquisition of knowledge. To myself I feel that it has been a hindrance, and it seems like a relic of the middle ages, when all important works were written in Latin for the benefit of the few who were Latin scholars."

It is not the science itself to which the correspondent objects, but the hard names which have deterred him from study. But really the names are not as formidable as represented. They help instead of hinder the study of science.

True, the botanical names are in Latin or have Latin terminations, this being the common language of all natural science the world over, so that a plant may be known by the same name in every tongue. If each nation had a nomenclature of its own, and a poor little plant had as many names as there are languages in the world, then there might be some reason in scolding about the nomenclature. The case is worse than this with common names, however, for each language has several of them for the same plant and many of these are misleading.

The correspondent cites for an example of a hard name *Anastatica hierochuntina*. The common name of this plant is "Rose of Jericho," which has misled him into thinking it a Rose or something like one. Now a little knowledge of botanical nomenclature would have shown him that this plant was a long way from the Rose family, and he would have known that the common name of all true Roses is Rosa. It certainly is more simple, more systematic, more easy to remember, if a single name—like Rosa—is used for all plants in one genus, with distinguishing specific additions for the separate species, than it is to have a name for each species which gives no hint of a plant's relationship to other plants. The name of the genus is like the family name or surname of an individual—as Davis or Smith—and the name of the species corresponds to the Christian name—as John or Jane. If one wished to study the ethnology of any race, would he consider it necessary to learn the names of the individuals before he learned the characteristics of the nation? Or would he make a plea that the names were so hard that it prevented him from gaining a knowledge of the people?

Any person who has a natural love of plants can become familiar with the botany of his neighborhood in one season. If not more than a hundred plants were well examined it would give a good general idea of our flowering plants, or if a person will patiently study even twenty well chosen examples he will thereafter have no difficulty in determining the species around him. The system of botany is so perfect that the study of one plant gives us a knowledge of the whole order or family to which it belongs.

Now if we look more closely at the dreadful botanical names, we find that when the genus was known to the Greeks and Romans, the old classical name is commonly retained. For instance, the genus Aster (of which we have so many wild species in the United States) is from the Greek word meaning a star. These little Star-flowers are everywhere on our roadsides, and in the woods and swamps, lighting up and making our waste places gay with their pretty white, or blue, or purple, or pink starry flowers. The specific name of these various Asters is often given to denote some character of the plant, so that the name is a clue to the species. Thus *Aster grandiflorus* means one with flowers large and showy; *A. acuminatus*, one with leaves oblong and sharp-pointed; *A. longifolius*, one with leaves long and linear. Would a common name for each species of Aster be an improvement upon this?

Some difficult names have been given to plants in honor of individuals; for instance, *Eschscholtzia Californica*, named for the discoverer, Eschscholtz, who found it in California, as the specific name indicates. Kosteletzkya, named for the Bohemian botanist, Kosteletsky, is another hard one; but these names are more difficult to write than to pronounce. Hundreds of other persons to whom genera and species have been dedicated have not been so unfortunate in their names, as, for example, the botanist Magnol, whose name lives forever in the beautiful genus Magnolia. Claytonia is named for Clayton, an early botanist in Virginia; and Jeffersonia for the President who sent the first exploring expedition over the Rocky Mountains. Other genera are named from some property of the plant, or appearance of the leaves or flowers or stem. For example, the genus Hepatica is named from the shape of the leaf, which resembles that of the liver; Sanguinaria from the blood-like color of the juice of the plant. The specific name, when it does not indicate where the plant comes from—like Japonica, from Japan—is most generally truly descriptive of some characteristic of the plant.

All this elementary talk is of course for beginners, and it means that while scientific nomenclature might be greatly improved, really it is much better, simpler and easier to learn than the wits would have young people and ignorant people believe. It will be found, too, that scientific nomenclature is necessary even as a basis of common names, and gives the only key to the identification of plants by common names. And last of all, it will be found that good botanists—those familiar with scientific names—know the most about the common names.

Vineland, N. J.

Mary Treat.

Destruction of Wild Plants by Roadsides.

To the Editor of GARDEN AND FOREST:

Sir.—A spasmodic attack of clearing up roadsides to which rural districts are frequently subject, has of late swept away several of those groups of Nature's planting upon which the eye lingers restfully when they are permitted to remain along county roads. One of these, where the pedestrian could pause among the shadows and note the variety of foliage, must have dated back many years, for its principal feature was a self-planted Apple-tree, the branches of which reached across the fence and drooped to meet a fringe of Hazel-bushes bordering the outer side of the footpath. Other shrubs gathered about these, one an Elder of large proportions, and a beautiful object when covered with its creamy white flowers or dark purple fruit. Many vines added their grace in fitting places, making altogether a pretty arbor, beneath which Ferns and Podophyllum found needed shade. All this and much more might have been urged in favor of this mass of growth, while on the other hand complaint was made, not without cause, that it was cumbering the pathway to the annoyance of passers-by. A judicious trimming, however, of the under branches and a removal annually of dead Blackberry-canes, would have obviated all difficulty in walking and saved it from wholesale destruction. Now the offending side of the tree having been cut away, and the shrubs trimmed off or grubbed out, there is little left above ground that bears promise of verdure in the near future; not at least until Nature shall have recovered her wounds and restored the loss from mutilation. Neither is there cause for hope that the tender plants now hidden beneath the soil will long survive unsheltered the extreme droughts to which the summers here are subject.

Another place of unusual interest to a lover of Nature was a small piece of marsh-land noted for the variety and brilliancy of its wild flowers, the great number of birds that dwelt among the Sedges and Willows, and also as the only spot in the neighborhood where *Cypripedium spectabile* might be found.

The land thus occupied, being destined to serve agricultural uses, is to be drained, and the occupant's first step was to burn it over, after which grub-hoe and axe were plied at the root of every tree and shrub. A strip of young timber on the higher land next the road, though of little use when cut, even for fuel, but of great value for shade and an attraction to birds, was included in the general uprooting, and many a choice wild flower will die out, lacking the protection and nourishment its leaves afforded.

It is to be regretted that persons who have highways in charge do not recognize the advantages to be derived from verdure in place of parched and barren roadsides.

The dry seasons and sweeping winds are a menace to the farmer, which he is constantly deploring, yet few land-owners spare any standing trees or protect those that spring up in waste places.

Klinger Lake, Mich.

Dorcas E. Collins.

Fuchsia triphylla.

To the Editor of GARDEN AND FOREST:

Sir.—In a late number of GARDEN AND FOREST, in a paragraph referring to Fuchsias, I find the statement made by a writer in the *Revue de l'Horticulture Belge* that *Fuchsia triphylla*, a native of San Domingo, was rediscovered in 1884.

Permit me to say, as a matter of historical accuracy, that it was rediscovered on that island by myself in the early spring of 1873. I disposed of it to Mr. Isaac Buchanan in the autumn of the same year, and later on he disposed of it to another florist, who in turn disposed of it (as I am informed) to one of the large florists in the neighborhood of London.

New York.

Thos. Hogg.

Notes.

Miss A. M. Vail, of this city, has been elected associate editor of the *Bulletin* of the Torrey Botanical Club.

The *Pacific Rural Press*, in its issue of the 12th of April, has an admirable portrait of the late Dr. C. C. Parry.

The perennial Candytuft is a plant which should be in every spring garden. Its leaves keep green all winter and it is already covered with snow-white flowers which endure for several weeks.

At a late meeting of the Royal Agricultural Society at Georgetown, Demerara, Mr. Rodway explained how ripe bananas could be dried so that they would keep in a condition of freshness long enough to be carried to England or America. The fruit was said to retain its flavor unimpaired for a long time.

The death is announced at Lucerne, in his seventieth year, of M. D. Bulan, one of the most successful and most generally employed landscape gardeners of France in recent times. His principal work was the Park of the Tête d'Or at Lyons, where he changed a great unhealthy marsh into one of the finest pleasure grounds of Europe.

The Massachusetts Horticultural Society has obtained the consent of the Boston city authorities to erect on the Common a mammoth tent for a horticultural exhibition to be held during the sessions of the Society of American Florists at their annual meeting in August next. It is expected that the exhibition will be one of notable interest.

A correspondent of the *Tribune* from Lakewood, New Jersey, states that more than 200 packages of *Epigæa* and *Pyxidanthera* are sent every day from that station by express and mail to distant friends by the sojourners there. Hundreds of the guests at the hotels, it is asserted, make it their daily labor to gather these beautiful little plants. There seems to be an unlimited supply of both species, but they will be practically exterminated from this region if this thoughtless devastation is carried on a few years longer.

In the "Sixth Annual Report of the Commissioners of the State Reservation at Niagara" the account of their work is carried down to the end of September, 1889. The number of visitors to the Falls is estimated at half a million annually, as many as 5,000 coming sometimes during a single day. The building of good roads in certain parts of the Reservation is the chief improvement now proposed. A map of the Reservation and its neighborhood is given with the report, and a geological appendix prepared by Mr. G. K. Gilbert, which tells the history of the Niagara River.

In our own country neighborhoods an effort might well be made to follow an example set in France, as recently noted in the *American Agriculturist*. In many French communes boards are set up bearing the following instructions: "Hedgehog: Lives upon mice, snails and wire-worms, animals injurious to agriculture. Don't kill a hedgehog. Toad: Helps agriculture; destroys twenty to thirty insects hourly. Don't kill a toad. Cockchafer and its larvæ: Deadly enemies to farmers; lays 70 to 100 eggs. Kill the cockchafer. Birds: Each department of France loses yearly many millions of francs through the injury done by insects. Don't kill the birds."

Two weeks ago we published an article by Mr. T. L. Mead, explaining how the various Palms in his collection at Oviedo, Florida, had endured the freezing weather of early March. Mr. Mead adds the following note in reference to the Ferns which were then growing in the open air: Older plants of *Cibotium Barometz* and *Blechnum Brasiliense* and young ones of *Lomaria ciliata* lost all their leaves, but new fronds are already beginning to push. The Maiden-hair Ferns, *Adiantum cuneatum* and *A. Wiegandii*, were hardly touched, and a quite extensive assortment of greenhouse Ferns bordering a small pool of water suffered less than many native species, *Osmundas*, etc., growing close by them.

Last year the Maple was chosen as the "State-tree" of New York by a vote of those participating in Arbor Day exercises, and it is suggested that this year a "State-flower" shall be selected in the same way. The student in the common schools of this state who presents the best essay, not exceeding 400 words in length, on the most profitable manner of observing Arbor Day, will receive a gold medal given by Mr. William A. Wadsworth, of Geneseo; and prizes of \$100 and \$50 will be awarded for the best kept district-school grounds in the state. Superintendent Draper announces, furthermore, that due mention in his report for 1891 will be made of the common-school student who, before the first of October next, shall transmit to his office the best collection of bark, wood sections, leaves and fruit of the "State-tree."

The comparative test between the heating power of steam and hot water, which was carried on a year ago at the Massachusetts Agricultural College, and which was reported in this Journal at the time (vol. ii, p. 186), has been repeated this year, and according to the last bulletin from that experiment station, with similar results. The record for the hot water boiler was in brief as follows: Total coal consumed from December 1st, 1889, to March 18th, 1890, 6,598 pounds; average daily temperature for the time, 49.74 degrees. The record of the steam boiler was: Total coal consumed from December 1st, 1889, to March 18th, 1890, 9,784 pounds; average daily temperature for the time, 48.39 degrees. That is, the steam

boiler, with nearly fifty per cent. more coal, gave an average temperature more than a degree lower for three months and a half.

Two gentlemen, one of whom is Senator Evarts, recently joined in building a charming stone bridge for the benefit of their fellow-citizens in Cornish, New Hampshire. "Such an act," says the Boston *Herald* very justly, "is not a great affair, but it is one of the many ways in which our New England towns may be put on a par with the villages in old England, where the bridges, built across the different streams, are often the most picturesque attractions in the landscape, and give it a distinction that could be gained in no other way. Next to a good road in a country village is the finely arched stone bridge that spans some tiny stream, and wherever you find the good road and the picturesque bridge people of refinement and education are apt to locate their homes. Though a small thing in itself, it may be believed that no single investment can be made in many of our New England villages to yield richer returns than the tasteful bridges which are constructed over its waterways. Here is an unoccupied field where men of wealth can show their taste and give distinction to their native towns, and be sure to have their names handed down to posterity in grateful remembrance."

Experiments conducted by Professor Goff at the Wisconsin Station last year indicate that a solution of carbonate of copper is a certain remedy for the Apple-scab. The solution is composed of one ounce of carbonate of copper dissolved in one quart of aqua-ammonia (strength twenty-two Baume), diluted with 100 quarts of water. One and a half gallons of the diluted solution are sufficient to thoroughly spray a tree of medium size, and two gallons for one of large size. It follows, therefore, that four ounces of carbonate of copper and one gallon of ammonia will make 100 gallons of the diluted solution, which is sufficient to spray fifty large or about seventy-five medium trees once. The ammonia should be kept tightly corked with a rubber stopper. To this the precipitated carbonate of copper should be added at the rate of one ounce to one quart of ammonia, in which it dissolves, forming a very clear, deep blue liquid. When ready to commence the application, add this solution to the water used for spraying at the rate of one quart to twenty-five gallons of water. The bottle containing the solution should be kept tightly corked. Three or four applications are advised, and it is probable that one made just after the leaves expand and before the flowers have opened would add to the efficiency of the treatment, as the fungus commences its growth quite early in the season. The liquid is applied with a force pump fitted with some kind of a spraying nozzle.

A correspondent of *The Garden* writes that the wild garden at Kew is just now very attractive with bulbs of various kinds in full flower and apparently quite at home amongst the long coarse grass. One slope is a sheet of gold with the Dutch Crocus. Besides the yellow variety, there are large purple and white forms and a host of rare species which seem to grow perfectly here. The Glory of the Snow (*Chionodoxa Luciliae*) has also made a home here, and from its scattered condition the bulbs seem to have produced seed freely. Should this prove correct we have here a splendid subject for naturalizing in the uncultivated portions of our gardens. It is perfectly hardy, taking good care of itself, and is withal one of the most beautiful of our early spring flowers. Near by are the Squills, *S. Siberica* and *S. bifolia*. Narcissi are also here by the hundred thousand, and we are told. The higher parts of the mound are at present white with *N. pulchellus praecox*, and should it become established here, which seems likely, so far as one can judge, it will be beautiful in the years to come. On the lower ground *Triteleia uniflora* is coming up strongly, and so are Primroses of all kinds, and on the sunny side are innumerable Tulips, Hyacinths, *Anemone fulgens*, Hepaticas and various Daffodils, prominent amongst them being the double *Telamonius*, which has already formed quite a sea of glaucous green foliage. Nearly all these bulbs would be equally at home in our own gardens and they all bloom at a season when flowers are especially charming.

Catalogues Received.

P. H. FOSTER, Babylon, Long Island, N. Y.; Deciduous Trees Evergreens, Roses, etc.—H. B. MAY, Dyson's Lane Nurseries, Upper Edmonton, England; Ferns and Fine Foliage Plants.—LEWIS ROESCH, Fredonia, N. Y.; Grape Vines, Small Fruit Plants, etc.—T. C. THURLOW, Cherry Hill Nursery, West Newbury, Mass.; Deciduous Trees, Evergreens, Fruit Trees, etc.—J. H. TRYON, Willoughby, O.; Grapes.

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Legislation for the Adirondacks.

THE Legislature of this state, which is soon to adjourn, has enacted three or four laws which ought to prove of distinct and permanent advantage to the Adirondack forests, and it has failed to pass certain other laws which are imperatively demanded if the safety of the forests is to be assured. Railroads are most to be dreaded as agents of swift and certain devastation. Every new line which penetrates the woods means remediless ruin as far as it goes, and the first duty of the law-making power toward the forest is to prevent the laying of another foot of track on the State Reservation. Existing charters cannot be revoked, but the authority now resting with the Commissioners of the Land Office to grant to railroad companies land belonging to the people of the state should be restricted; and the failure of the bill exempting from this provision of the General Railroad Act the lands included in the Forest Preserve is a calamity.

On the other hand, convictions for trespass on the state lands have been made more practicable by the Change of Venue Act, which authorizes a trial where it may be possible to secure jurors who have not been educated in the belief that the state has no right to protect its own forest-property. The amendment now pending, with good prospect of passage, in regard to the cancellation of sales by reason of occupancy, which shifts the duty of giving notice from the state to the claimant, will be of great assistance in quieting the title to lands which of right vests in the state. The act appropriating \$25,000 for the purchase of lands by the state is important as establishing a policy. The amount named will buy but little land, but it recognizes the principle that absolute ownership on the part of the state gives the only assurance of a proper administration of the forest-region. But perhaps the most important step taken was the enactment of the concurrent resolution directing the Forest Commission to investigate the advisability of establishing a State Park to contain some three million acres, embracing the head waters of all the streams

of consequence which take their rise in the wilderness. The report which is to be made to the next Legislature is to include an estimate of the probable cost of the land, with suggestions as to the proper boundaries of the park and a discussion as to its various local features, with reference to their value for this special use.

Of course this does not commit the state to the policy of buying the lands now in private hands which it will be necessary to acquire if a compact area of the size contemplated is secured. But it does show a readiness to consider the question with a full appreciation of the fact that to carry out the project will cost millions of dollars. Many of the questions to be answered are puzzling enough. If the scheme is considered advisable, will it be more prudent for the state to go into the market as a buyer or to condemn the land and trust a commission to fix its value? Will it be better to insist on taking all the land as it is, or to pay a lower price for some and allow the removal of its marketable Spruce, say, under certain restrictions? Scores of questions like these will obtrude themselves upon the Commissioners, and even if they could command the help of skilled subordinates in making the needed surveys and investigations they will be obliged to keep steadily at work throughout the year if a report is prepared which treats the matters involved with adequate thoroughness.

Our own belief is that the land should be bought, and that it never can be bought to so good advantage as it can to-day. The difficulties in the way of the purchase are almost appalling, but they will grow more serious every year. The entire tract could have been bought for a song when the Commission with Horatio Seymour at its head reported on its condition, and every one now sees that it would have been a wise investment for the state. If the proposed purchase is now abandoned there is little doubt that the people of the state in after years will look back to this failure as another lost opportunity.

THE following paragraph appeared last week in the *Boston Herald*.

Monday afternoon, Thomas Coughlin, living on the Tower road, Lincoln, started a brush fire near his place, and, the wind shifting, his barn was destroyed with its contents, entailing a loss of \$1,500. The fire continued through the woods, and yesterday afternoon reached the dwelling of Michael Leahy, on the same road, destroying it; loss, \$4,000. Last evening the fire was still raging furiously, and the residents of the town had turned out en masse to fight the flames, which have burned over nearly 300 acres.

Similar paragraphs appear almost daily at this season of the year in the daily journals published in the Northern States.

A man thoughtlessly and carelessly sets fire to his brush-heap. He may or may not have selected a proper day for this operation. The wind changes or increases, and before he knows it, almost, his bonfire has extended to a neighboring bit of woodland, and once having started, the conditions at this season of the year being particularly favorable for the spread of fires in the woods, a great conflagration is generally the result. It is folly to expect people to improve their woodlands or to hold forest-property as long as such property is subjected to unrestrained burning at the hands of irresponsible people. The lumbermen's adage that "no forest is safe until it is cut down" will hold until the public is willing to afford some protection to property of this character. It is not easy to see why one man should be allowed to jeopardize his neighbor's property and another should be restrained from doing so. This community would not hold that a resident of Fifth Avenue who should be restrained from building a big bonfire on a windy day in his back yard would suffer injustice, and yet his fire would not be a greater menace to his neighbors' property than the fire of a farmer burning his brush-pile. There can be no security of forest property in the Eastern and Northern States until laws are passed regulating within proper limits the setting of brush fires by individuals on.

their own land,' and making them responsible for the damage caused by such fires. To secure the passage and enforcement of such laws, should be the aim of our various forest associations and of all persons interested in forest-property.

THE Autocrat of the Breakfast-table has the love and veneration of the old school New Englander for those noble Elm-trees which, when he was a boy more often than now, were the glory of the typical New England homestead; and thirty years and more ago he proposed the scheme of an imaginary work illustrated by photographs taken upon the same scale of magnitude, and accompanied by letter-press descriptive of New England Elms. Now at last this scheme assumes definite shape, and Little, Brown & Co., of Boston, are to publish "Typical Elms and Other Trees of Massachusetts." Dr. Holmes himself, as is fit and becoming, stands god-father to the enterprise in a charming introduction; the illustrations are reproductions, by the photogravure process, of photographs made by Mr. Henry Brooks, of Medford, whose fellow-townsmen, Mr. L. L. Dame, furnishes the accompanying text which supplies historical and statistical information about the different trees. Tree lovers in America have long felt the desirability of a work of this sort to preserve portraits of famous and remarkable American trees just as Strutt preserved in his classical "Silva Britannica" portraits of famous British trees, and Mr. Brooks earns their gratitude by doing this very thing. The work is not taken in hand too soon. Many of the trees which were famous in New England when New England was an English colony, disappeared long ago, as have many of the less famous trees Dr. Holmes speaks of in his preface; and the number of really great and distinguished trees is growing less every year in all the northern parts of the country, where changed conditions, material and social, are rather against their successors replacing them in historical interest or in mere bulk of trunk and spread of branches. Mr. Brooks' book will appeal to all lovers of trees. It will be a quarto volume of more than one hundred and twenty pages and will contain fifty illustrations. It proposes to show the possibilities attainable in Massachusetts by trees of different species under favorable conditions. Trees remarkable for age, beauty, size or historic interest have been selected.

Flower Painting.

TO paint a flower well four things must be shown: color, form, texture and substance; the hue of the blossom must be rendered, its outline and the shape of its petals, the peculiar quality of the surface of these, and the degree of solidity or fragility in which their accumulation results. Then, to make a good picture with the chosen flowers, other things must be considered—as the grouping of the subject, its lighting and the general color-scheme of which the hue of the flowers themselves forms but a part. The task, in short, is a very complicated one. If the amateur is apt to consider it the easiest he could attempt, his recklessness is explained by the fact that even a poor rendering of a very beautiful theme will attract the uncritical eye. One needs to paint admirably well to please any one with the picture of a potato; but a picture of a Rose, though it be but a travesty, passes for something pretty with the majority of observers.

The more experienced artist, knowing the difficulty of his enterprise, usually takes the quite allowable course of insisting more upon one side of his theme than upon the others. Perhaps he lays most emphasis upon the decorative effect of his picture as a whole, trying to do no more than indicate the characteristics of the flowers which are its most prominent feature. He arranges them in an effective mass and insists on their coloristic beauty as related to the surroundings which he has supplied for them, leaving their form, their texture and their substance to be divined from the hints he gives. If these hints are rightly given, if they point to the truth although they do not explain it, and if the main explanation is truthful and beautiful, the critic finds no fault with the picture. He accepts it as an interpretation of one quality which the flowers possess; and he knows that it is not needful that art should try to show more than one thing at once. Naturally, in this kind of flower painting, only such models should be

chosen as lend themselves best to the special aim in view. Peonies, Chrysanthemums, China Asters and a hundred common summer flowers like the Eupatoriums and Goldenrods are by nature adapted to a treatment in which a mass of gorgeous color is the aim, depending little upon form, texture or substance for the beauty we find in them; and the same may be said in a lesser degree of Geraniums and of double Violets, which are good material for smaller pictures of the kind. Any one who has been familiar with our annual exhibitions will remember the delightful large water-colors of Miss Greateorex, where, very often, masses of brilliant blossoms have been shown in the white paper cones dear to Parisian peddlers, giving a delightful picture not, in strict truth, of the flowers, but of their coloristic beauty.

It would not be wise to choose such flowers as these when effects of linear beauty are desired in a picture, but there are others admirably suited for such a purpose, like the Iris, the Amaryllis, the Narcissus, the Tigridia, and many kinds of Lilies, from the Japan Lily of the garden to the Wild Lily of the fields. All these are exquisite in color, but owe their peculiar charm even more to form. So beautiful, indeed, are their forms that if these are sympathetically felt and faithfully rendered, color may be entirely suppressed and still the picture be pleasing. A black and white drawing of a row of China Asters would be scarcely worth making; but such a drawing of a row of Irises might be well worth seeing. Decorative artists have known these facts in all the great building ages of the world. The Lotus, the Honeysuckle, the Iris, the single Rose and star-shaped blossoms of one sort or another have been most conspicuous in architectural ornament when it is painted as well as when it is carved.

Certain flowers are chiefly remarkable for what may be called dignity of bearing. The Gladiolus has this dignity together with great beauty of form in the individual flowers; the Fox-glove, the Larkspur, the Tuberose and the Crown Imperial have it; and the Hollyhock has it without any special elegance of form. Again, a graceful habit is the most characteristic trait, as with the Solomon's Seal, the Laburnum, many flowering shrubs, and, in a different way, the Lily-of-the-Valley and the Poppy. Still again, an angular, somewhat eccentric manner of growth is the plant's main characteristic, as in many which Japanese artists love to paint; and flowers of such kinds should, of course, be painted so as to bring out their special qualities most clearly.

No one would paint flowers chiefly for their texture (as one might paint a piece of satin) or chiefly for their substance; these are characteristics which can sometimes be almost overlooked, and at other times be made of accessory importance. That is to say, when the picture as such is the prime consideration, when a general decorative effect is desired above all else. When we come to absolute portraiture—to the rendering of flowers for themselves, not for the part they can play in some larger scheme of beauty—then texture and substance must be as much considered as form and color. To give the shape and tint of an Azalea blossom without giving its translucent texture, its fragile substance, would be to caricature it. To paint a Catherine Mermet Rose and not show that it is solid and heavy would be—not to paint this Rose. Naturally it is very difficult to achieve all these qualities together—to give the form of a flower exactly without making it seem hard, its color exactly without slurring its form, its substance exactly without travestying its texture. It is so difficult that we rarely see complete success except where the task has been simplified as much as possible. The best portraits of flowers are apt to be those where a very few blossoms of a single sort have been arranged and lighted as simply as possible. When Mr. La Farge shows us a single Water Lily he gives its form, its color, its texture, its substance—almost its odor. But did he conceive a large group of Water Lilies with adjuncts of various sorts, arranged and lighted so as to make a striking pictorial effect, he would probably choose some one quality of the flower for accentuation and merely hint at the others. At all events, though success with his single blossom cannot have been easy, it would be infinitely more difficult with many.

When flowers are painted as they grow out-doors in masses, forming part of a landscape composition, then, naturally, nothing but their color need be insisted upon, no matter what may be the dignity or elegance of their forms upon closer examination. Color is always the quality that, as painters say, "carries furthest," remaining distinct at a distance where forms and even habits of growth may be quite invisible.

On the average exhibition wall we seldom enough find any true excellence in the painting of flowers. Even good taste in the placing of the models so that their peculiar characteristics might best be presented to the painter is very rare. Gladioli are heaped together in a low bowl; double Violets are spread

out in a ragged line; Hollyhocks are plucked from their stems; Pansies are strung into a frieze; rough little Chrysanthemums are stuck up stiff and single. But Roses—it is Roses that are most often attempted and most seldom portrayed. Years ago we complained that they were always too hard; now things have changed—they are almost always too soft. Their color has been the sole concern. Achieve this, the painter seems to say, and what matter though they look as if made of a layer of cotton wool without thickness or outline or velvety surface? The worst is that even color cannot be achieved unless texture at least is given; we may match the tint of a Rose-petal in cotton wool, but the two tints will not be the same. When, from time to time, we find evidence of an eye that has seen the whole beauty of a flower and a hand that has had the skill to render it, then we are indeed content, though we see nothing more than one Rose on its stalk or two Carnations in a tiny bottle. We are content, although the portrait can hardly be called a picture, just as when, on the other hand, we find a beautiful picture we are content if it only indicates the beauty of the flowers that inspired the painter. To ask for everything together is to ask what only the greatest masters of the brush could give us. Indeed, it is doubtful whether any great master has ever given us, could even give us, a canvas in which we should have perfect pictorial beauty of an impressive kind, and perfect portraiture of flowers as well. Yet nothing is easier, thinks the amateur, than to paint flowers.

An Old New England Bridge.

THE bridge of which we give a picture on page 215 is on the old Boston and Newburyport Turnpike, and spans the Ipswich River at Topsfield, where for fifty years it has borne witness that such a structure can be at once rustic and monumental looking, that it can show the most evident solidity and yet harmonize perfectly with the natural aspect of the shores between which it stretches.

There is nothing about this bridge to show whether it stands in New England or in Old England, and it would look as thoroughly at home in any country where stone of a similar kind can be found. The semicircle is the simplest of all arched forms, and is certain to be selected by primitive or rustic builders; the comparatively shallow voussoirs, as small as is compatible with safety, are likewise characteristic of men whose desire is to build as cheaply as possible, and who think of security rather than monumental effect; and the irregular shape and rough surface of the other stones, and their association without mortar, tell a similar story. On a small scale it is the same sort of a wall that we find in the so-called "Cyclopean" structures of primitive Greece. And work of the same sort is still seen in the farm-walls of all parts of New England where there are granite ledges to be easily split. There is no reason why bridges of just this character could not be built everywhere in these districts to-day; and our picture is sufficient proof of the desirability of building them.

A dozen miles below Topsfield, at Ipswich, is the more famous "Choate bridge," which was built about 1760, and whose stone arches are still as sound, and a great deal more beautiful, than when they were first erected. The Black Willow, the White Maple, the Red Ash and the Swamp White Oak here fringe the banks of the Ipswich, and make them interesting, but the beauty of the river scenery is heightened by these solid spans of time-colored stone. And yet to erect them nothing was required but the unskilled labor of country masons, guided by the instinct of some one who knew the practical and artistic value of the simple round arch and the massive wall.

Our illustration is from a photograph by Rev. E. C. Bolles, D.D., of this city, to whom we are indebted for its use.

In a California Cañon.

ASPECTS of out-door life in California have often received literary treatment in the broad way, and on a large scale. Yosemite and Shasta are known, and the forests of giant Pine, close-carpeted with trailing Ceanothus, and the mountain acres brilliant with Calochortus blooms. But many a Californian can leave a thickly settled valley of orchards and find himself, in ten minutes' walk, in a flower-crowded mountain cañon, flooded with April sunlight, and stirred by all the springtide sounds and pulses. Perhaps Thoreau would have thought this as wonderful and satisfying as to dwell in the remote fastnesses of those Sierras that King, Whitney and Muir have so finely revealed.

The cañon I have just visited is one of the many small ones in the Coast Range on the eastern side of the Santa Clara

Valley, sloping west. The sea-winds rise and pass over them, and the fog drifts through the deeper river-cañons, so that these short, steep ravines are warm and sheltered, full of early pasturage and bloom. Their charm is in their nearness. A hundred yards from the wide wheat fields and the closely tended orchards of Apricots, Peach, Prune and Cherry, now in the full current of bloom, carries one into the mouth of the wooded cañon, which rises sharply, with little turns and pauses, to the outer crest of the Coast Range. If one goes quite to the top, it is only half a mile, and a broad rolling mesa with hill-tops rising over it extends several miles and then descends to another valley. The cañon consists of just this wooded, steep half mile of ravine, and its flower-covered sides sloping to the north and south. There are thousands of such cañons in California, and thousands that are much larger and more imposing, but not more interesting to the lover of hills and trees.

There were flowers in bloom all winter in the sunny shelters of this cañon, not many, to be sure, but a few flame-colored *Eschscholtzias*, the brilliant California Poppy and golden Mustard, and the wild Pea by the brook. A month ago, even this rainy and late season, the Larkspurs began to bloom on the yellow shale in sheltered spots. The grass has been growing everywhere since the first rains, and now, in these early days of April, it is knee-high in many places, and the heads of Wild Oats are half out of their sheathes. It is a tangle of growth from the mossy rocks by the water's edge to the windy summit of the hill.

The place is locally known as "Morrison Cañon," and the little stream is Morrison Brook. At every step on the way up its course, except when one is hidden under the great Oaks and Maples, the slightest backward glance reveals the sloping width of the orchard-planted valley, the Bay of San Francisco and the purple San Mateo Mountains beyond, filling up the whole western horizon.

First, at the foot of the hills, between the Almond-orchard and some one's vineyard sloping south, where the brook crosses the lane, bordered with Willows and Sycamores, one finds early blue and white *Nemophilas* in clusters in the grass, one or two plants in a place. There are brilliant masses of glowing *Eschscholtzias*, and above on the hill-side blue and purple Larkspurs (*Delphinium simplex*), and saucy *Dodecatheons*. The cañon begins, as most of them do, in well-pastured slopes, but the bottom is full of Live Oaks, just in bloom, Maples with leaves half grown, and Sycamores, Horse-chestnuts and Alders, all in the first rush of spring.

Pretty soon, as we go on, the hillsides are seen to be covered with patches of color, in acre-wide splashes. Here and there are Buttercups (*Ranunculus Californicus*), far more firm in texture than those of New England, and lasting a week or so in a flower-vase. There it is the pretty purplish blue *Gilia* (*G. multicaulis*), mingled with the white *G. dichotoma*, and Clovers, with half a dozen little *Cruciferae* and *Compositae* that make up in numbers for what they lack in individual glory. Clumps of the scarlet Painted Cups (*Castilleja foliosa*) illumine the hill-side. This fine perennial often has forty or fifty heads on a single plant, and blooms most of the year. It grows in clumps with the lovely red stemmed, "Rock-brake" Ferns (*Pellaea andromedaefolia*) that dot the warm hill-sides. Such clusters as they make, too, in this old-fashioned district, where even the children are careful not to destroy the roots! You gather all you care to carry from one or two clumps.

Since one has begun to seek the Ferns, a step below the path into the shelter of the trees and rocks reveals the Gold Fern (*Gymnogramme triangularis*), which children love to gather and press on cloth to leave the pollen-stamp of dusky yellow. Still further down the ravine at the bottom of the cañon the Gold Fern is more abundant, and with it, in moist, mossy crevices of rock, are young pink-tinted and emerald fronds of the delicate *Adiantum emarginatum*. On the northern slopes are tall Chain Ferns (*Woodwardias*) and taller bracken. There are white and purple Trilliums there, too, and spicy-scented Wild Currants (*Ribes tenuifolium*) just passing out of bloom, while higher up a mass of Holly-leaf Cherry (*Prunus ilicifolia*) is just beginning to flower. Somewhere about here there is a Cercis-tree that ought to be well in blossom, and the pretty Wild Gooseberries are abundant. *Ribes Menziesii* has a little whitish flower, and after a while a prickly, oval, red berry that children like. *Ribes divaricatum* has round, smooth, black berries, really excellent and worthy of cultivation.

On the hill-sides, close to the fragrant new-budded Oaks, are massive, semi-tropic plants of the *Balsamorhiza*, with its many-flowered yellow heads. Near them are groups of rose-

colored Wild Onions (*Allium unifolium*), and thousands of the blue-flowered Camass (*Camassia esculenta*), which once was one of the most common growths of the valley, eagerly dug up by grizzlies and by Indians. In the opens, near the trees, creeping along the ground or clambering over bushes, one finds the white Star-flowers and graceful leaves of the great Man-root (*Megarrhiza Californica*), whose large, prickly balls, filled with seeds and soapy pulp, are gathered by the country boys to throw at each other in imitation of snow-ball fights. Along in these opens, on the slope, one finds the purple and yellow *Fritillaria lanceolata* now, and more or less all summer. Vines of the common Clematis (*C. ligustricifolia*) cover some of the Oaks and Sycamores. The delicate white Star-flowers (*Tellima heterophylla*), one of the Saxifrages, grow in these fringes of the wooded part of the cañon.

Higher up the hill-slopes, but still not far away, are yellow, wild Violets (*Viola pedunculata*), with their brown backs and habit of clustering in colonies, a few yards across. This beautiful plant has been naturalized in some of the valley gardens, where the flowers are often as large as a quarter of a dollar. The sweep of grass over the rounded hill-top is cream-white for acres with the fragrant Cream-cups (*Platystemon Californicus*) and flame-red with Poppies. In places the Orthocarpuses, such as the purple and white *O. purpurescens*, mingle with white and blue Lupins, Gilias, Phacelias and the white and pale magenta Collinsias, to make a dazzling patchwork. Some of the most effective *Compositæ* of the Coast Range-region seem somewhat lacking in this particular cañon; but the rare flowers, becoming scarce elsewhere, are still massed almost as abundantly as twenty years ago. The broader slopes of the mountains show tints of white, yellow, scarlet, purple and blue from the valley below, and many species of plants contribute to the effect; but Buttercups, Eschscholtzias and Castillejas certainly cover the widest areas. It seems as if a thousand children might gather posies on the pastures that slope to this one cañon without lessening their brilliant colors.

Niles, Cal.

Charles H. Shinn.

Vegetation in Southern Alabama.

LATE in February I wrote to GARDEN AND FOREST, giving some account of the vegetation here which showed that it was much farther advanced than was usual at that season of the year. Soon after—that is, in the early days of March—a norther swept over this region during the prevalence of which the mercury fell to twenty-four degrees, Fahr., and of course proved destructive to many tender plants. In observing the damage inflicted upon the various forms of plant-life in the garden, the field and the forest, it is interesting to note the variety in the injuries sustained by the plants which were overtaken by this cold blast when they were in their most active growth.

Of the ornamental trees and shrubs from the tropics and most of the plants from sub-tropical regions, considered hardy with us, all were more or less injured, but only a few were killed outright. Of the more tender kinds, the Cestruums, Brugmansias, some of the Lantanas, such as *L. Camara* and its varieties and most of the Abutilons were killed to the ground and entirely lost, as also were the Grand Duke and the Star Jessamines (*Fasminum Sambac*, var., and *F. pubescens*). The following had the younger branches killed and were stripped of leaves and flowers: *Rhynchospermum jasminoides*; the China-berry-tree (*Melia Azederach*); Crape Myrtle, *Lagerstræmia Indica*; Oleanders, the white being the greatest sufferer; *Hibiscus mutabilis*; *Plumbago Capensis*; Pomegranate; *Magnolia fuscata* and *Sterculia platanifolia*. Only the three last species are producing a new set of flower-buds.

Of the woody plants of the same category, the following escaped almost unhurt, receiving no check in the progress of their vegetation: *Pittosporum Tobira*, Azaleas, various Viburnums, at the time more or less with open flowers; *Laurus nobilis*, Cape Jessamine (*Gardenia floribunda*), the sweet-scented golden Jessamine (*Fasminum odoratissimum*), Hydrangeas and all of the Indian or Tea Roses, which had in some localities their flower-buds injured, but were soon producing again an abundance of flowers. *Cycas revoluta*, *Zamia integrifolia* and such exotic conifers as Biota, Retinospora, Cupressus, Araucaria, Cunninghamia, Podocarpus, were not in the least damaged. Of the bulbous plants, many of them far advanced, the true Lilies were cut down; Amaryllis, Gladiolus, Alstrœmerias, Zephyranthes were but slightly injured and are at present in full flower.

The greatest injury was inflicted upon fruit-trees. The branches of the Orange were killed to the larger limbs; the Japanese Medlar suffered severely—the young, tender wood

of the branches and the greater part of the foliage is dead. Covered with the blackened, shriveled fruit and the dead leaves, this tree presents a sorry sight. The Fig crop will prove a total loss, and that of the Pecan has been cut down to a very great extent; all the youngest shoots and the flowers and leaves, just emerging from the cover of their winter bud-scales, having been killed. The Japanese Persimmons or Kaki in my garden are killed to the root.

Strawberries received but a slight check, from which they soon recovered. Protected by a slight covering of straw, they continued to produce their fruit, and shipments to northern markets were but little interrupted. The damage to the products of the vegetable-garden and the truck-farm was not as great as was first anticipated, although the comparatively small proportion of the crop of Irish Potatoes already above ground is entirely lost, and so is the crop of Peas, from which shipments to northern markets had just begun.

The deciduous trees of the forest were stripped of their new foliage, and a fortnight after the frost they still presented the bald and sombre aspect of midwinter. Among the Oaks, the shoots of this season, with the flowers and foliage more or less advanced, were destroyed in the following species: Spanish Oak, Post Oak, Upland Willow Oak or Blue Jack, Turkey or Barren Oak (*Quercus Catesbaei*), Water Oak, Laurel Oak and Willow Oak (*Q. Phellos*). The Live Oak escaped all injury, and the various Hickories, with the exception of the Pecan, were found to have received no damage. The Cherokee Rose is covered anew with a second crop of flowers. The Pines and other coniferous trees of this section, which at the occurrence of the frost were either just past flowering or in full flower, do not seem to have sustained any injury.

Mobile.

Carl Mohr.

New or Little Known Plants.

Ligustrum Sinense.

THE illustration on page 213 represents a branch of the Chinese Privet gathered last November in Parsons' Nursery, at Flushing, near this city, and serves to show the value of this plant for the autumn decoration of gardens. *Ligustrum Sinense*, although it is by no means a new plant, is not very often seen in gardens, and it gives us therefore a good deal of pleasure to find it flourishing in this climate. The number of plants which retain ornamental fruit on their branches until the beginning of winter is not large. Such plants, however, are very valuable in this climate and it is desirable therefore to add as many to the short list as possible.

This *Ligustrum*, as it appears at Flushing, is a loose-growing shrub, six or eight feet tall, with slender branches covered with light gray bark. It is no doubt an evergreen in a milder climate than this, or holds its leaves until spring, at least, as there was a large part of them on the Flushing plants at the time of our visit, and they were still bright and fresh.

The fruit is small, but of a beautiful dark color, and is produced in the greatest profusion on all the upper branchlets of the stems, which thus appear to end in great terminal racemes of berries, one or sometimes two feet long and a foot or more broad.

A flowering branch of this plant was figured in 1878 in the *Gardeners' Chronicle* (n. ser. x., 964); but it is the fruit and not the flowers which is its chief beauty and makes it a desirable plant to cultivate.

Foreign Correspondence.

Covent Garden, London.

COVENT GARDEN, or "Cummin Gardin" of the costermonger, and "Mud-salad Market" of *Punch*, is one of the sights of London which visitors are recommended by the guide-books not to miss, but which few ever see as it should be seen. Whilst the rest of London is sleeping, Covent Garden is all life and bustle, for the market begins at four A. M. All night long, carts, vans and wagons, piled with hampers, boxes, cabbages and garden-produce of all kinds, are rumbling along the many streets which converge at Covent Garden. They come from the suburbs of London, from the wharves and from the railway-stations bringing the produce, not only

of English gardens, but of Germany, France, Holland, Italy, Australia and America, for sale in this market. Thousands of tons of vegetables, fruit, plants and flowers are brought here, sorted, sold by auction or otherwise, and taken away again on almost every day in the year.

Covent Garden is within a stone's throw of the Strand, which runs equidistant between the market and the River Thames. It is not far from Westminster Abbey, of which it once formed part of the grounds, Covent being a corruption of convent. The Convent Garden, "an enclosure or pasture browsed by deep-udder'd kine, and probably the haunt of the lark and nightingale." In 1552 it was granted to John, Earl of Bedford, and in 1631 the market square was laid out, and the arcades or piazzas erected. The market was confined to a grove of trees, beneath which the stalls of the dealers were placed for shelter. By the middle of the eighteenth century the market had become important; but it was used for the sale of other com-

wide and fifty feet high. These again are flanked by the shops and offices of wholesale dealers and agents. Auction sales are held here daily at ten o'clock, and from soon after midnight crowds of porters are engaged in transferring from the vans outside packages of all kinds and from all directions. Huge cellars below all the buildings and passages afford storing accommodation for vegetables and fruit which are not for immediate sale. Hundreds of bunches of bananas and pineapples from the West Indies are stored here to ripen. Above the shops there are more storerooms. Four staircases lead from the central passage to a range of conservatories stocked with aquatic plants and animals, foreign birds of all kinds, hardy plants, principally conifers, in pots and tubs, with other garden material, all calculated to delight the dweller in town and tempt him to buy.

The roads surrounding the markets are broad, for the convenience of the large vans which in the morning block the



Fig. 36.—*Ligustrum Sinense*.—See page 212.

modities besides the products of the garden. In 1830 the numerous wooden sheds and stalls were swept away and replaced by the present market-house. Loudon wrote of this building in 1831: "To walk through this market with the recollection of what it was three years ago, gives rise to a variety of reflections. By what cause has it come to pass that the pillared grandeur and temple-like magnificence, which in former and no distant times were exclusively devoted to the edifices consecrated to the gods or occupied by princes, are now judged appropriate to the scene of humble industry and the abode of every-day people!"

The whole market occupies a space about 400 feet square, or, say, three acres. The buildings consist of a central avenue or arcade, with shops on each side, which are stocked at all times of the year with the choicest and richest fruits and flowers. These are open all day. Parallel with the arcade on each side is a spacious glass-roofed hall 200 feet long, sixty feet

way. The flower-market is a handsome structure, which was erected in 1885 to meet the enormous increase in the wholesale trade in this department. It covers an area of about 150 feet square and fifty feet high. A broad central path and numerous narrower side-paths divide the whole into plots, upon each of which is a cast-iron stage with three tiers, the top one eight feet from the ground. Upon these the plants and flowers are arranged. The space is let in lengths of ten feet, the name of each holder being over his stall. This space is rented at the rate of one shilling and threepence per square foot per annum. Even this market is not nearly sufficient to hold all that is brought by the London market-gardeners, for whose exclusive use it is kept, and outside there are numerous vans from which the flowers and plants are purchased direct. This is probably the handsomest and best arranged flower-market in Europe, and it is the depot of the very best of flowers and flowering plants that England can produce. Every

morning by four o'clock the stalls are crammed with the choicest of what is grown by the London market-gardeners, and by nine o'clock, or even before, it has all gone, and the market is closed.

The Duke of Bedford receives from rents and toll levied on all goods brought to the market something like £20,000 a year.

Covent Garden is the principal of the three markets in London where garden products are sold. A large proportion of the daily vegetable and flower requirements of the four million inhabitants of this great city is distributed from here. The wealthy proprietor of a West End flower-establishment, the humbler green-grocer and florist, the crafty costermonger and the poor flower girl all come here for their daily or weekly supplies. The streets are crammed with vehicles of all kinds either discharging or loading; gangs of men are rushing to and fro with loads of baskets or boxes, and for about five hours all is bustle and noise. Gradually the vehicles get away, the noise of the workers decreases, until by nine o'clock, or about the time when the comfortable Cockney comes down to breakfast, the market is over, and Covent Garden has assumed its daily quiet. Few who see it in the day have any idea that in the small hours of the morning this small corner of London was alive with busy men and women, and almost every foot of the square and adjoining streets was packed with loads of fresh vegetables and flowers "all a blowin' and a growin'."

London.

Visitor.

Cultural Department.

Pruning the Peach.

THE fruit-buds of the Peach are this spring quite generally killed by frost. Opportunity is thus afforded to prune the trees, by which matured Peach-orchards may be benefited. It may be best done on what may be styled the "renewal system" of pruning. This means to remove the entire head of the tree.

It is the habit of this tree as it enlarges its growth to set the bulk of its fruit at the extremities of its branches, which are often broken by its weight. As Peach-orchards are usually managed, or mismanaged, a full peach crop generally causes the ruin of many of the trees. After a bountiful harvest a Peach-orchard sometimes looks as if a tornado had swept through it. We see naked stumps of Peach-trees from which all the limbs have been torn by the burden of an excessive crop of fruit. This may be Nature's system of pruning the Peach, but from observing it many years ago I learned to improve upon Nature by the practice of a more orderly style of pruning.

After the growth of the Peach-tree starts in April, and the leaf-buds have opened, saw off all of the limbs of the tree to within, say, two feet, or even less, of where these branch from the trunk. The tree will then form an entire new head, and in one season make a growth of six or eight feet of new wood which will set fruit-buds and may bear fruit the next year. I have thus renewed and re-renewed an orchard of twenty acres of Peach-trees, securing by this treatment finer fruit, which was more easily gathered, and securing the trees from damage by breakage of limbs from the load of a crop. After the trees have borne two or three crops, and their branches become elongated, pass through the orchard, shortening in the heads, as above described, of alternate trees in the rows. The next spring do the same to the trees left unpruned the year before. The orchard may then be allowed to grow as it pleases for some years, after which the tree-heads may be again shortened in alternately as before.

The Cherry and other stone fruits may be similarly treated, with advantage to the tree and great improvement of its product. This tree-pruning should be deferred until growth has fully started in spring—from April 20th to May 20th. If the tree be thus headed in during winter, or while its vitality is dormant, it may never awaken into life; but its branches may be all removed after vital action is begun without harm to the vigor of the tree. In fact, it is a good rule to practice all kinds of pruning when a new growth has begun to develop. Many horticulturists consider it imprudent to thus remove all of the limbs of a tree at one operation. They argue that it may give a shock to the tree's growth, from which it may not recover; therefore it is generally advised in top-grafting to remove a portion only of the branches at once, deferring removal of the rest until the next year. Such has not been my practice. In forming a new head to the tree by pruning or by grafting I have invariably made an entire decapitation at once, and during the past forty years I have found this practice always satisfactory.

Vineland, N. J.

Alexander W. Pearson.

Grapes for Everybody.

MR. WILLIAMS' list of Grapes is so good that I feel inclined to add some notes from another soil and climate. I should, for general planting, exclude Cottage entirely and Moore's Early almost wholly, and would moreover advise every one to plant Worden alone for a black grape. I see no reason for planting Concord any longer. Worden is equally hardy and prolific, and is of better quality. It is sweet as soon as colored and hangs well on the vine. It is a capital keeper, much better than Concord in this respect. It has the thin skin of the Concord class, but does not break so easily. A cross between Herbert and Worden would be nearly perfect. Why, then, shall we not adopt Worden as for the present our ideal black early Grape? For late black I would place Herbert ahead of Wilder and the rest. But if a really very early black Grape must be had, Moore's Early is so far our best with me.

For red grapes I agree in selecting Brighton if planted with other vines to supply pollen. But next to it I should name Gærtner, one of Rogers' hybrids not at first appreciated. Lindley is a fine Grape, about as good as Massasoit, which Mr. Williams does not mention, and not quite as early. I should make my list of reds Brighton, Gærtner, and Salem, I think.

For white grapes I do not hesitate to take Diamond for the head of the list. I think it is sufficiently tested and by the best judges in all parts of the Union. I have not seen one severe stricture on its quality, growth, habit or bearing qualities. Lady, at last, I am compelled to discard. It yields no crop to speak of. It is my ideal grape in quality, but it will not prove itself even a decent vineyard grape for cropping. Niagara I class with Diamond. But Hayes is very fine indeed and perhaps we shall learn to rank it first or second, for Niagara mil-dews very easily. Duchess I should not hesitate to include in the list, were it not tender. It must be covered; but in quality it is delicious. Pocklington is a grand grape when dead ripe, but it is too often sold and eaten when only half ripe. Empire State is nowhere near as good as it ought to be. Martha, if thinned sharply, is fine; otherwise, poor. I make my list of white grapes Diamond, Hayes, Niagara and Duchess.

Now for special purposes there is another list necessary. Iona is unequaled for a red grape if protected. Goethe, if well placed in a sunny spot, is also delicious—late and a grand keeper. Jefferson, if well ripened, is superb. For arbors, barns, etc., August Giant is a remarkably rampant grower, prolific and quite a good grape. Eldorado is a fine grape, unsuited for general planting, but a vine or two deserve a place. Mr. Campbell, of Delaware, Ohio, will offer us before long some new hybrids, some of which by his favor I am testing. I am inclined to think our progress in grape improvement is nowhere near its end. The points already achieved are size, prolific bearing and hardiness. We should work to eliminate seeds largely. Most of the Rogers' hybrids are very seedy; Jessica is little else. Diamond is a great improvement in this direction. Iona, with its small seeds, is nearly perfect in all points but in hardiness. Goethe is the nearest approach to the hot-house grape, but it is too late for the Northern States, except in very favored spots. Let me add that success with Grapes depends more than all else on a high, well drained soil.

Clinton, N. Y.

E. P. Powell.

The Babianas.

THE Babianas are a very pretty genus of bulbous plants, natives for the most part of the Cape of Good Hope; they all have long and narrow leaves, folded lengthwise like those of some Palms and covered with fine hairs, except the small species, *B. Socotrana*, whose leaves are smooth. They are of very easy cultivation, needing to be potted in September in a light soil and to have plenty of water, sunlight and air. The temperature of an ordinary greenhouse is sufficient for them. Thus treated they will be in flower in February, and being from their plaited leaves and the color of their blossoms unlike other Cape bulbs, they furnish an agreeable variety and never fail to attract attention.

Like most bulbs from the same country they are hardy enough to do well in a cold frame if there is not room for them in the greenhouse, and so treated they flower very finely, but at a time when Scillas, Narcissi and Muscaris are plentiful. I have a long row of them now (April 21st) about five inches high in a frame, which in about two weeks will be in blossom.

There are about twenty species known to science, some of which are not in cultivation and many of the others not to be had of ordinary dealers; for even the Dutch wholesale dealers and growers can supply only four or five species at the most, and those often incorrectly named; the remainder of the "fifteen most beautiful sorts" offered in their catalogues are

seminal varieties of *B. stricta*. The only way known to me of obtaining the greater part of the true species of this and other genera of Cape bulbs is to order them from the sales division of the Cape of Good Hope botanic garden, which by the niggardly policy of the government is compelled by this means to make up for a miserable half-appropriation.

B. sambucina is one of the best species, horticulturally speaking; its flowers are large and showy, purple with a dark line traversing each division of the flower. It is strongly perfumed with the fragrance of the Elder, and like many other species, produces auxiliary bulblets. *B. spathacea*, *B. tubata* and *B. tubiflora* are very curious and interesting when in flower, but the blossoms are inconspicuous and produced on very short stalks, so that the plants frequently bloom unobserved by those who pass them daily. The flowers of these three species have tubes four inches long and their colors are straw or cream or faint purple. *B. disticha* also has light colored flowers, produced on spikes six or eight inches long, and the plant is well worth growing. *B. plicata* with large purple and yellow flowers is one of the finest kinds.

Mr. Baker considers the plants known as *B. villosa*, *B. rubro-cyanea*, *B. obtusifolia*, *B. purpurea*, *B. sulphurea* and *B. plicata* mere varieties of *B. stricta*, and I know from experience that some of these may be raised from the seed of that species.

bell-glass, say, or in a propagating frame. Plants from seed require somewhat similar treatment, but need a little watching when quite small, because much moisture on the foliage causes them to damp off. *Bertolonia marmorata* is an old favorite, and, though not quite so showy as some of the more recent introductions, yet is well worthy of cultivation. It has ovate, slightly hairy leaves of a light green color, and variegated with irregular markings of white, the under side of the leaves being purplish. This plant has also been known as *Erianema marmorata*, and is a native of Brazil.

Bertolonia margaritacea is another excellent sort, and, though very pretty as an individual plant, is more effective when several are massed in a pan, which is decidedly the best way of growing for exhibition. *B. margaritacea* produces leaves from four to six inches in length, olive green in ground color and ornamented with lines of pure white spots.

B. superbissima, while resembling the last named in some particulars, is even more beautiful, the spots on the leaves being bright pink and the under surface being uniformly colored with a similar tint.

But the gem of the genus is a hybrid of garden origin, *B. Van Houtteana*, which has the largest foliage and the brightest variegation as well. This consists of streaks and dots of purplish pink or magenta, which contrasts effectively



Bridge at Topsfield, Massachusetts.—See page 211.

Some of these forms are very beautiful. *B. plicata* is white or nearly so; others have the divisions of the flower alternately white and purple or yellow and purple; another is very dark purple with black blotches. *B. rubro-cyanea* is a very striking flower whose colors are blue and crimson, much like those of *Geissorhiza Rochensis*. The genus is said to be named from the Dutch word for baboon, because the animal feeds upon the bulbs of these and other plants.

Canton, Mass.

W. E. Endicott.

Bertolonias.

THE Bertolonias form a group of beautiful small-growing stove-plants, their simple ovate or obovate leaves being remarkably attractive on account of varied colors and markings. The flowers are not of any special value, the chief beauty of the plant being found in its foliage, and unless seed is desired it is best to pinch out the flowers as they appear, as their perfection is usually attained at the expense of the foliage, which suffers both in size and vigor if the flowers are allowed to develop. The Bertolonias luxuriate in a warm, moist house and should be well shaded, as the foliage is too tender to endure full sunlight. They are readily propagated from seeds, or from cuttings, which root freely if placed in a good bottom heat and kept rather close for a time under a

with a ground color of olive, and forms a combination seldom equaled among variegated plants. These four varieties would make a good beginning for any one who wishes to try this class of plants, though several others may be added to the list if desired—for instance, *B. guttata*, *B. Mirandæi*, *B. Marchandii* and *B. vittata*, all of which are good.

Bertolonias prefer a light, open soil of equal portions of peat or leaf-mould and loam, with enough sharp sand to make the compost open and easily drained. The pots or pans should be well supplied with drainage material, and the plants liberally watered, though it is advisable to keep the water off the leaves as much as possible, and especially so during the winter.

Holmesburg, Pa.

W. H. Taplin.

Hardy Plants for Cut Flowers.—II.

A MOST useful spring-flowering plant is *Trillium grandiflorum*, the best of the genus, owing to the size of its flowers and their pure white color when first opened; this, however, turns to purple with age. *T. ovatum* and *T. stylosum* are both good, and also white. Trilliums usually appear to the best advantage when well established, and this is usually the second or third year after planting. They thrive best in a shady position, and a virtue may be made of necessity by

planting them under trees where other things would not succeed. For naturalizing in such places Trilliums are invaluable. If the growing of hardy plants under glass were advisable, Trilliums might be so treated and flowered a month earlier, as is often practiced in England. But, as a rule, plants that are thoroughly hardy are more enjoyable when flowering at their own sweet will than when forced into attenuated and premature bloom under glass.

Doronicums have lately come into favor for cut flowers, and justly so. They are not only well adapted to this purpose, but they rank among the choicest of early summer border-flowers. We have tried five species and varieties, all of which are perfectly hardy. *D. Caucasicum*, *D. plantagineum excelsum*, and, where it will thrive, *D. Clusii*, are three of the best sorts. Of the variety Harpur Crewe we have had no personal experience. Regarding the culture of Doronicums, one thing should be borne in mind—they do not like any soil other than that of a retentive nature, and this was noticeable even in a summer like the last.

With the first appearance in April of its elegantly cut foliage, *Dicentra eximia* commences to bear deep rose-colored, nodding flowers on stems a foot long, which may be gathered from April to the end of October. *D. eximia* is a native of the southern Alleghanies, but it is perfectly hardy, and without the disagreeable odor so noticeable in others of the genus. There are few other hardy plants that flower continuously six months of the year. *Helenium Hoopesii*, another native plant and a composite, is a showy and useful border-plant, not so well known as it should be. *H. Hoopesii* grows two feet high, and bears numerous bright orange, Daisy-like flowers in early summer; its culture is of the simplest; any ordinary border-soil will suit it. *Daphne Cneorum*, though not a herbaceous plant, is usually included among collections of such, and certain it is that there are few plants so worthy of being in every garden, both for the fragrance of its blossoms and the freedom with which they are produced nearly all summer. We have noticed, however, that this *Daphne* is a trifle more exacting than many other plants as to the soil it is to be grown in. We are told that it is indigenous to southern Europe among rocks, in gravelly soil with plenty of humus, and it will be found that if, when planting *Daphne Cneorum*, this is borne in mind, and anything approaching a heavy, wet soil avoided, the plants will grow rapidly with no further attention, and yield abundantly its delicate pink blossoms. The Trollius, or Globe-flowers, resemble gigantic Buttercups, and flower in the early days of summer. *T. laxus* is common in wet meadows in the Eastern States, and is well deserving of cultivation. The sepals of this and the next species are concave, forming a kind of globe, hence the common name. *T. Europæus* grows a little taller than the last, and is usually eighteen inches to two feet high, and has very large yellow flowers. *T. Japonicus* has bright orange colored flowers, and is a distinct species. The above three form a pretty group in a moist soil in the open border. We have found that Trollius-seed sown under glass, and carefully protected, does not germinate in two years. The next seed was sown when gathered, and was well frozen in a frame in winter, and it germinated promptly with the coming of warm spring weather. These remarks apply to many other seeds, such as those of *Anthericum Liliastrium*, *Gentiana acaulis*, *Gillenia stipulacea* and *Allium Karataviense*.

Passaic, N. J.

E. O. Orpet.

Notes on Wild Flowers.

Asarum Virginicum (Wild Ginger), which has been in flower for more than a week, is a valuable plant for a shady location. The flowers are not conspicuous or showy, but the foliage is very pretty, and it endures through the winter, appearing as fresh in early spring as at any season. The leaf, nearly round-heart-shaped, is shiny above, often mottled with white, and of a thick, leathery texture. The plant is hardy, easy of culture and conspicuous in early spring because of its fine foliage. It is a native of Virginia and other southern States around and among the mountains. *A. arifolium* is another species from the south with much the same kind of foliage, but not so thick as that of the former. The leaves are larger, halberd-heart-shaped, dark green, often blotched with white or lighter spots. They endure through the winter, as do those of *A. Virginicum*, and should be grown in the same location.

Few of our native plants reward the cultivator more bountifully than the Hepaticas (*Anemone Hepatica* and *A. acutiloba*). Both are hardy, are not difficult to grow, and give a profusion of flowers of various shades and colors in early spring when there are but few other plants in bloom. The foliage is also fine on strong, well established plants and endures through

the winter. Hepaticas can be grown in the shade where most plants would not thrive, or in a fine loamy soil they do well in full sun light.

The Pasque flower (*Anemone patens*, var. *Nuttalliana*), just flowering, is one of our finest native Anemones. It is a native of the western prairies, but thrives well in any moist, well drained soil in the sun. Its earliness makes it the more valuable. In strong, well established plants the flowers are three inches wide, light purple or almost white in color. They open in the warmest portion of the day and close at night, and endure for several days. They appear before the leaves, and a bed of these plants has a strange appearance when covered with large, erect flowers without foliage.

Southwick, Mass.

F. H. Horsford.

Orchid Notes.

MAXILLARIA LEPIDATA.—In a descriptive note on this Orchid (see page 127), Mr. M. Barker asks if the plant he describes is the same as what is grown at Kew under this name. His description might have been made from the Kew plant, except in regard to size, the latter being a large one, over a foot across; it flowers freely every year in March. Lindley's description, referred to by Mr. Barker, appears to have been made from imperfect material, but he used the word *acaulis* as indicating the section of the genus to which *M. lepidata* belonged—i. e., those species characterized by the pseudo-bulbs being clustered, and showing no distinct stem or rhizome. To this group belong all the best of the garden Maxillarias—namely, *M. luteo-alba*, *M. grandiflora*, *M. nigrescens*, *M. picta*, *M. venusta* and *M. Sanderiana*. All these have ovate pseudo-bulbs, large strap-shaped leaves and erect one-flowered racemes.

A second group has the flowers in short, compact racemes, and is represented by *M. hyacinthina*, *M. leontoglossa* and *M. elongata*. These have lately been removed from Maxillaria into a separate genus—namely, *Xylobium*. The third group includes all those with distinct rhizomatous stems, such as *M. variabilis* and *M. purpurata*. Altogether there are about 120 species of Maxillaria known, but only a few of them are of any value as garden plants.

ANGRÆCUM CITRATUM is one of the prettiest of small Orchids. It has short, tongue-like, bright green leaves resting on the soil, and, springing from their axils, the most elegant spray-like spikes of flowers, some spikes being a foot long. The flowers have long spurs and a flattened arrangement of the segments, which are nearly an inch across; their color is a pale cream, almost white, with a pale bluish shade on the labellum. They are arranged in two perfectly straight rows, one on each side of the spike, and they are so pure, so elegant, and, withal, so lasting in freshness, that we know of no plant, Orchid or other, with which to compare them. The species is a recent introduction from Madagascar.

Kew.

W. W.

HEUCHERA SANGUINEA.—Lovers of beautiful rock-plants will be pleased to learn through Mr. Orpet's note of the hardness of this plant. I have still further evidence of its hardness. Seedlings raised during 1887 withstood the winter of 1887-'88, which will be remembered as a severe one. Considering the ease with which this plant may be propagated, it should become common, and be sold cheaply for forcing, for which it is as well adapted as the common *Astilbe Japonica*. Seeds sown as soon as ripe and wintered in boxes in a cold frame come up early the following spring. I have adopted this plan of sowing seeds over winter with much success, especially with slowly germinating species of Columbines. *A. glandulosa*, if sown in this way, germinates freely and is just as easy to manage as any of the common kinds, while if sown in spring sometimes three-fourths of the seed will lie over, or come up straggling all summer.

GROWELL.—I am also pleased to be able to record the hardness of the Growell, *Lithospermum prostratum*, a trailing, semi-shrubby Boraginaceous plant, with pretty blue flowers, exceeding in intensity of color the Forget-me-not, and rivaling the Virginian Cowslip, *Mertensia Virginica*. This plant is easily propagated by soft-wood cuttings. It will not thrive in a wet place.

LENTEN ROSES.—We set out a number of these plants in grass under a spreading Hickory last summer after being forced, and were delighted to find all in bloom on April 3d. A splendid effect could be produced by planting in this way some of the fine hybrids like Willy Schmidt, Hofgarten, Inspector Hartweg, Commissioner Benary, Frau Irene Heinemann, *Helleborus colchicus*, *H. purpurascens* and others. I should not care to risk *H. niger*.

Hydrangeas.—It is common to see large specimen plants of *H. hortensis*, but small ones are rare. Few greenhouse plants are so easy to grow and so useful in a small state. Cuttings taken in spring from half matured shoots root readily almost anywhere. Superfluous shoots broken off will sometimes take root on the benches. When rooted they can be planted out-of-doors, where, with abundance of water and sometimes a little liquid manure, they will make nice plants by the fall. They may be taken up and potted into six-inch pots, and if kept cool and moderately dry they will ripen their wood, in which state they may be kept until wanted, say in February, for forcing. A night temperature of fifty-five degrees is sufficient, with abundance of water and a light position.

Wellesley, Mass.

H.

Seasonable Hints.—Most forehanded gardeners in this latitude are well along with their early spring work and yet those who have been delayed by unfavorable circumstances can still begin with every assurance of good returns for their labor. Where early vegetables are appearing the crops should be thinned out as soon as the plants are large enough. Novices too often forget that each plant requires room for development, and that a square foot of soil will support only a certain amount of vegetable life. Radishes should be thinned until they stand two inches from centre to centre. Beets should stand four to six inches apart; Onions three inches; Lettuce from six to ten inches, according to the size of the variety; Carrots from three to four; Spinach, for the spring crop, three to four inches; Turnips four to six inches. Of course Peas and Beans do not require thinning, while Cabbage, Cauliflower and Celery are to be transplanted, and the first two should stand in rows three feet apart and eighteen inches apart in the row. Stirring the soil should begin as soon as the plants make their appearance. This is not only to pulverize the clods and make all the plant food available to the young roots, to admit air into the soil and to open it so that it will drink in the rain, but it is the only time when the weeds can be successfully subdued. When the weed-seeds have just germinated a little disturbance and exposure will destroy them and make after-cultivation much more easy. Successional crops of Peas, Beans, Lettuce and other vegetables sown earlier should be put in, but it is yet too early to plant Corn, Lima Beans, Melons or any other tender vegetables in the open ground. The conditions of early spring have lingered so long that small fruits may yet be planted. They should be severely pruned, because the rapidly increasing temperature will hurry forward the leaves before the roots are prepared to supply them with adequate moisture. Tobacco dust mixed with half its bulk of insect powder and sifted on Grapes, Currants, Raspberries, and in fact on all the shrubs of the garden which are developing foliage, will help to keep away numerous insect pests. The dusting should be done while the dew is on the leaves.

The Flower Garden.—The season is still young enough for planting hardy shrubs and herbaceous plants, if the precaution is observed to head in shrubs more severely than is necessary earlier in the year. Be in no haste to set out tender plants. Those which are purchased are generally taken from under glass, where they have not been hardened off, and a raw wind or a chilly night will give them a shock from which they will not recover all the season. In selecting varieties, novices should confine themselves to old and well-tested kinds. So called "common" flowers and shrubs have become well known because their merits have been established after years of trial and selection. They are invariably good and effective, and they are usually better than more recent introductions. The testing of novelties is one of the pleasures of gardening, but the experimenter will be disappointed if he hopes that many of these new acquaintances will be as worthy of care as the old and standard occupants of the garden.

Bergen, N. J.

P. O.

Correspondence.

The Noxious Primrose.

To the Editor of GARDEN AND FOREST:

Sir.—Perhaps a few notes on the irritation of the skin by *Primula obconica* may still be in order. The plants on which my observations were made were fully developed specimens, and had been propagated by division of last year's plants—not raised by sowing seeds after the more natural method. About five hours after the work of picking dead leaves and flowers from about a hundred of them, the backs of the hands and portions of the arms began to itch, and a slight swelling of the parts affected was noticeable some five hours later.

The swelling disappeared in twenty-four hours, but the irritation was not wholly gone until the seventh day. It was very slight at its most acute stage, while the swelling caused no inconvenience whatever. The application of soap and water to the affected parts hastens and increases the irritation. Moisture appears to aid the injurious propensities of the plant, for it is noticeable that the irritation and swelling are more severe when either the skin or the plant is wet.

A good botanical dissecting microscope fails to reveal any trace of vegetable hairs in the skin after contact with the plants; and this fact suggests the belief that the plant secretes a poisonous fluid. The irritation differs from that caused by minute spines entering the flesh. In the latter case a sharp sense of pain is experienced, and, guided by it, each individual spine may be located; but in the former, larger surfaces appear to be affected. I have consulted with several persons who have grown the plant in quantity, and a few others have experimented at my request, so that I have information concerning its effect on thirty-nine persons. From the facts, I have calculated that about fifty per cent. of those who work among the plants are subject to their peculiar effects. Temperament and complexion appear to be unimportant factors in the matter; but two colored men whom I persuaded to test the plants remained wholly uninjured after prolonged contact with them. The experiences of some white gardeners and florists are similar to those of these two colored men, no amount of contact with the plants affecting them in the slightest degree. The irritation varies in intensity, and in some cases it is extremely slight. It is generally confined to the arms and backs of the hands, but there are important exceptions to this rule. Mr. K. Finlayson, a gardener at Brookline, Massachusetts, had his eyelids affected, though no part of his face had come in direct contact with the plants. He had been cleaning a number of plants, and his hands, he says, which were also affected afterward, may have been brought in contact with the face while that operation was proceeding. Mrs. M. H. Hutchins, a florist of North Cambridge, Massachusetts, had a similar experience. Mr. Finlayson believes that the hairs which clothe the flower-stalks are in some way the cause of the injury, and says: "My belief in this is strengthened when I remember that I can handle all other parts of the plant with impunity." Plants raised from seed appear to be less injurious than those propagated by division of the old plants; indeed, I have yet to find a case in which the irritation can be traced to one-year-old seedlings. Perhaps the hairs grow harder and sharper, or more virulent, as the plants grow older? It is somewhat difficult to get reliable information on this point, as the plants are propagated by both methods and mixed in most establishments. Seedlings do not injure Mr. Finlayson, though he is particularly liable to be affected by the older plants. Some further information on this phase of the question would be very desirable.

Botanic Garden, Cambridge, Mass.

M. Barker.

Nepenthes and a Gardeners' Problem.

To the Editor of GARDEN AND FOREST:

Sir.—Mr. Burbidge's interesting note on the exact climatic conditions in which he found *N. Rajah* and *N. villosa* serves a double purpose. First it proves that I was in error when I stated that *N. villosa* was in cultivation, the plant grown in gardens under this name being, as he points out, *N. Vietchii*.

In the second place, the particulars given by Mr. Burbidge in regard to *N. Rajah* form, when placed by the side of what was stated recently in GARDEN AND FOREST (see p. 108) and what I have since learned in England in relation to the cultivation of this Nepenthes, the strongest possible testimony to the truth of the statement that botanical science (including, of course, geographical botany) affords little information as to the best methods of cultivation for many plants. It is clear from what Mr. Burbidge says that in a state of nature *N. Rajah* grows only at high elevations and in conditions such as he says clearly indicate that under cultivation a lower temperature is necessary for this species than for the others. Mr. Moore's own story of his success with this plant, as quoted by Mr. Barker in GARDEN AND FOREST (see p. 146), proves that cool treatment is not disagreeable to it. But it appears now that while we here have been struggling to overcome the difficulties at first attendant on the cultivation of *N. Rajah* (it is just possible that some knowledge of the natural conditions put most people here on the wrong tack!) you in America have had it "flourishing for several years in stove-houses along with other Nepenthes, forming pitchers freely and flowering, no trouble having ever been found in its management."

Truly there is a great deal more to be got out of this question of cultivation versus nature than we have seen yet. I learn from Messrs. Vietch that although they could not manage *Nepenthes Rajah* anyhow when they first received it, yet now they find no difficulty in making it grow and pitcher freely in the same house which contains the general collection of *Nepenthes*, and where when tried a few years ago it obstinately refused to grow! This behavior is not an uncommon occurrence with new introductions. Of course we must believe that some essential condition had been absent when failure was the result, and had been included by accident when success was attained.

A comparison of the plants grown by a market-grower in his "rough and ready way" with those of the same kind produced in well equipped gardens generally places the former a long way first. The market gardener has hit upon the conditions essential to the healthy growth of his plants, hit upon them by experiment most likely, whilst probably the "scientific" cultivator has taken a lot of pains to afford the conditions about which the plants are probably indifferent and omitted those upon which everything depends.

Kew.

W. Watson.

The Study of Botany.

To the Editor of GARDEN AND FOREST:

Sir.—I have been much interested in your various articles advocating the study of botany by young people, and think you may care to print the following sentences as an indication that those who are best qualified to speak on the subject of education are in agreement with your views. I quote from an article called "Education in Boyhood" by President Timothy Dwight, published in the April number of the *Forum*:

"I would most heartily respond also to the words of the gentlemen of the Society of Naturalists who have addressed a paper to the teachers of schools and colleges in which they commend with special emphasis the study of botany and physical geography for the years of school life. The knowledge of botany gives a joy which should be in the possession of every educated man, and should be gained, as it easily can be, in the early youthful season. Science everywhere brings us into a close relation with nature. The boy in his first days of growing boyhood is open to all the sympathies which this relation bears with itself. Let him by all means have the sympathies awakened. He may not indeed be able to penetrate very deeply into what nature has to reveal to him, but he may see with delight all that he can as yet understand. . . . The beginning is never to be lightly thought of, because it has not the fullness of the end. . . . There is cheerful hope for the youth whose mind and heart are stirred with love for all the truth and beauty hidden in the natural world."

Pittsburg, Penn.

W. G. R.

Hardy Plants at Passaic, New Jersey.

To the Editor of GARDEN AND FOREST:

Sir.—Hardy plants are such general favorites that a few notes of a hurried visit to the nursery of Mr. Henry Meyer (successor to Woolson & Co.), at Passaic, New Jersey, may be of interest. Mr. Meyer has lately removed to a property several hundred feet north of his former grounds and now has ample room to develop his growing business. The nursery fronting on the Passaic River and extending back with several acres of plateau, embraces also a wood-covered slope which is being utilized for the naturalization of suitable plants. The houses are long, low, ten-foot spans, especially built for the propagation and protection of hardy and half hardy stock, no tender plants being grown. Though great spaces have been made in the benches by early shipments of plants, all the old favorites and many new ones were to be seen by scores and hundreds. Mr. Orpet, the skillful propagator of the establishment, is an enthusiast in hardy-plant culture, and here may be seen seedlings of many plants under trial that their merits may be tested before they are sold. Of course in a nursery of this kind little effort is made to grow flowers, but many interesting ones could be seen. *Primula verticillata* is a gem—a strong growing species from Abyssinia with fragrant yellow flowers. The leaves are large, four to five inches long and covered profusely with "meal"; altogether a charming variety, although of course requiring the protection of glass and attention in the way of careful watering. *P. cortusoides* is also a very satisfactory species just coming into bloom. This also seems happier in a house or frame. *Dianthus latifolius* was a mass of rich, large, crimson blooms. If this variety proves as continuous a bloomer as it now promises to be it will be a first rate garden plant. Pinks usually have

much too short a blooming season. The Clove Pinks were here in great variety, but "Paul Engelheart" with its great crimson flowers on rigid stems was the only one in bloom. The Drabas are neat little alpine plants. Two good ones are *D. bruniifolia* (Caucasian), which was showing its yellow flowers above dense mats of light yellow foliage, and *D. cuspidata*, with its attractive bronzy rosettes. A new alpine is the double-flowered *Alsine verna*, which forms carpets of very fine dark green foliage, studded with pure white small double flowers. It is a gem for the rockery.

In the frames were blooming *Isohyrum biternatum*, a charming native plant with the aspect of the little wood Anemone. *Anemone Apennina*, with its beautiful blue flowers, was in full bloom, following closely *A. blanda*, whose season has ended. Shortia established in pots showed its lovely white flowers. White Violets and *Phlox subulata* made charming bits of color. In the fields the hybrid Hellebores were still in bloom, quite uninjured by any weather changes. Polyanthus and Auriculas were of course in force. Unless for trade purposes it seems a mistake to grow the former of these in frames, as on a well drained border they are perfectly hardy and much more floriferous than the plants protected by frames, where their energies seem to tend more to the production of leaves. Alstroemerias are favorite plants here, *A. aurantiaca* and *A. Peruviana* being established in warm quarters, while the somewhat rare *A. peregrina alba* was opening its pure white blooms in one of the houses. A large breadth of *Chionodoxa Lucilia* was a brilliant picture in blue, rivaled by the light blue flowers of *Scilla puschkiniioides*, one of the best of the early Squills. Narcissi are grown in great abundance, Mr. Woolson in former years having had a very large collection which he was wont to exhibit at the shows of the New York Horticultural Society. The collection is somewhat reduced now and comprises principally the bold growing kinds of the most esteemed varieties. Henry Irving and Sir Watkin had passed out of bloom, but beside a grand lot of Horsfield's variety in its prime, the numerous other kinds seemed only fair, though favored with all the fashionable names.

Time was too limited to investigate the treasures of the hill-side, where it would seem that many shade-loving plants could be grown very successfully; but it was pleasing to see testimony of the growing demand for well known plants in the great stock of Aquilegias, Artemisias, Phloxes, Irises of all kinds, *Corceopsis lanceolata*, *Erica carnea*, *Daphne Cneorum*, *Anemone Japonica* and scores of other sterling old-fashioned kinds among the novelties of promise.

New York.

G.

Recent Publications.

The Garden, as Considered in Polite Literature; with a Critical Essay by Walter Howe. New York: G. P. Putnam's Sons.

Inside and out this is one of the most charming little books ever presented to lovers of gardens. As it forms the twenty-seventh volume of the Messrs. Putnam's well known "Knickerbocker Nugget Series," the character of its pretty binding and delicate typography do not need particularly explanation. The essays it contains begin with Pliny the Elder's "Pleasures of the Garden," which is followed by his nephew's famous descriptions of his two country-seats, types of the more modest and the most sumptuous kinds of Roman villas. Bacon is the next author quoted, with his delightful little paper "On Gardens," and Sir William Temple follows. Then come three essays from the *Spectator*, two by Addison, and one which has been variously attributed to Pope and to Dr. Parnell. A chapter of Pope's from the *Guardian* and Lady Mary Wortley Montague's "Letters to the Countess of Bute" succeed; and then we have extracts from Whateley's "Observations of Modern Gardening," from which is usually dated the rise of our literature dealing systematically with gardens of the modern, natural, landscape sort. Oliver Goldsmith's "Description of a Chinese Garden" and "History of a Poet's Garden," and Horace Walpole's little biography of Kent and "History of the Modern Taste in Gardening" are then given, and the book concludes with John Evelyn's "Of Fences and Quickset Hedges," which is placed out of its chronological position, yet wisely, as it differs from the other essays in being of a less general character.

All these essays are of course familiar to students of literature and of the history of gardening. But even to readers of this kind their association in a single volume will give them a fresh charm, and they will undoubtedly be new to many whose interest in gardens has been of a practical rather than a literary sort. But their value to either class of readers would have been far smaller without the delightful and in-

structive essay with which Mr. Howe has prefaced the book. Modestly called an "introduction" it is in fact a masterly little sketch of the history of gardening in which many authors are quoted who have no place in the body of the book, while the historical significance of those who have such a place is made clear. Especially interesting are the passages which explain that different styles of gardening have developed since the seventeenth century although we are accustomed to mass them together under the general name of the "naturalistic" style; and also those which lay stress upon the progress of the art in recent days and the greater difficulty of the tasks laid upon the modern designer as compared with those of his predecessors. "The ends of the earth," says Mr. Howe, "now contribute a wealth of plant life adapted to useful and ornamental tree and shrub-culture and to decorative horticulture. Their habits and relative value in a landscape effect, or in a garden, must be familiarly known and felt by an artist who may be called upon to make studies for a lodge in Scotland, a villa at Cannes, or a park in Australia; who may be required to bring back the primitive verdure to the banks of Niagara, to preserve the natural beauties of the Rockies, or to plant the plains with the forests they can and should be made to support. The rich flora of China and Japan have now been acclimated in Europe—and even more successfully in America—and the enormous number and variety of trees, shrubs, herbaceous and other plants now added to the resources of gardening call for correspondingly greater learning and training than has ever before been given to the subject, so that the accomplished landscape artist of to-day is as far beyond the Kents and Le Nôtres of the seventeenth and eighteenth centuries as they were beyond the topiarius who tortured the trees and shrubs of Pliny and the Cæsars."

Nothing could be more judicious than the following remarks with which our brief notice of this delightful little book must close: "Two qualities which usually distinguish professional from amateur productions in art—namely, simplicity and breadth of treatment—are especially important when applied to the face of Nature itself. True, Nature will, in course of time, protect herself from the misguided assaults of well-meaning amateurs by covering up or wholly destroying their abortive exertions. A trained artist, on the other hand, knows how to assist Nature without resorting too bluntly to the easy device of servile imitation. In such work, particularly as now taught and practiced, there is produced an impression of repose and well-balanced composition that is suggestive of natural effect and yet satisfactory as a work of art." How true this is, yet how constantly does the public admire a beautiful park for its "natural" charm, forgetting the fact that there is nothing like a park in Nature, and that it requires the very highest artistic skill to produce one which shall look as though Nature might have formed it.

Periodical Literature.

The most attractive articles in recent numbers of the *Century Magazine* have been three, written and illustrated by Mr. John La Farge, called "An Artist's Letters from Japan." The series will be continued, and promises to give the untraveled reader a more vivid and fresh idea of the land of Chrysanthemums than has hitherto been given in our language. The most interesting chapter thus far published appeared in March. Text and pictures are equally delightful, and together they emphasize various points with regard to the Japanese treatment of landscape and plants which, in a bolder fashion, have already been suggested to our readers. For example, the benefit that a beautiful view derives from some sort of foreground framing is admirably shown in one of the pictures where tall trees on steep banks draw close to the road, and it is spanned by a torii, through which the approaching eye perceives a wide plain, and as the centre of the picture a group of low buildings and trees. A torii, it should perhaps be explained, is composed of four bars, two set upright and two running across near together at the top, the upper one being curved with the concave side up. "This assemblage of four lines of stone or wood or bronze," writes Mr. La Farge, "is to me one of the creations of art like the obelisk or the pyramid. Most impressive, most original of symbolic entrances, whether derived from sacred India or from the ancestral ignorance of Polynesia, there is something of the beginning of man, something invented while he lived with the birds in this elementary porch, whose upper line, repeating the slope of hill and wave, first embodied the curve that curls all upper edges in the buildings of the farther East. . . . Looking through a torii one is sure to be in the direction of something sacred, whether it be temple or shrine or holy mountain.

Neither closeness nor distance interferes with this ideal intention, and the sacred Fusi-yama is often seen a hundred miles away in the sky, framed by these lines, built for the purpose." Well may the writer say that "the Japanese sensitiveness to the beauties of the outer world is something much more delicate and complex and contemplative, and, at the same time, more natural, than ours. Outside of Arcadia I know of no other land whose people hang verses on the trees in honor of their beauty, where families travel far before the dawn to see the first light touch of the new buds." Of the forests along the traveler's way, he says: "Sometimes there were traces of enclosure about these woods; sometimes they had no edgings but their own beautifully modeled contours. Long ages, respectful care, sometimes fortunate neglect, have made of these reserved spaces types of an ideal wildness, for these are sacred groves, and they are protected by the divine contained within them. This preservation of a recall of primeval nature, this exemption of the soil from labor, within anxious and careful tillage, is a note of Japan constantly recurring and a source of perpetual charm. . . . As the evening came on we crossed a large river and looked down from the height of the new bridges upon the discarded ferry-boats, and upon the shape of a more fantastic one that was never meant to sail—a Pine-tree, shaped and trimmed, spread its green mast and sails in a garden by the water." The famous avenue of giant *Cryptomeria*, twenty miles in length, that leads to the shrines of Nikko has often been described before, but these touches of detail show a true artist's eye: "Where an occasional habitation or two or three are niched in some opening, the tall columns of the great trees are interrupted by spaces filled with crossed branches of the wilder Pine, and behind these, outside, sometimes the light green, feathery mass of a Bamboo grove. Against the bank stood low thatched buildings; near them the great trees were often down, or sometimes dying; an occasional haystack, sliced off below by use, was fastened in thick projection around some smaller tree. Once, at a turn of the road near a building with a wide roof pushed against the corner-bank, out of a basin fringed with Iris sprung in the air a little jet of water. Near by a solitary ditcher had placed in a Bamboo fence some bright red blossom, with its stem and leaves, apparently to cheer him at his work." The picture called "The Waterfall in our Garden" is most interesting as showing how keen is the Japanese sense of fitness and harmony in gardening design. How often do we see Weeping Willows where they look badly themselves and hurt everything about them! So often that we have been tempted to feel that there can be no way of placing them well. But look at this picture and we see that in the lands whence they originally came they are charmingly employed. Here a narrow and very drooping one stands on a bank just beside the top stones of a little cascade. The falling water and the falling branches repeat one another's lines, and each feature gains by the presence of its neighbor, while behind the Willow lower trees of more normal shapes do not stand inharmoniously erect, but bend to form a sort of little arch above the waterfall.

A few weeks ago we noted some words of Mr. Charles Dudley Warner's, comparing the Rose and the sentiment it breathes with the Chrysanthemum, which, to his eyes, seems a mere showy, heartless and unpoetic plant. It is amusing to learn from Mr. La Farge that a Japanese might very well speak in just the opposite way of these two flowers. When he "smelled for the first time the fragrance of wild Roses, looking like ours but a little paler," he says: "This was the first thing which reminded me of home—the Roses that the Japanese do not seem to care for, do not seem to understand. With them the Rose has no records, no associations, as with us, for once on this side of the garden of Iran, the Peony and the Chrysanthemum, the Lotus and the Iris, the Peach, the Cherry and the Plum make up the flower poetry of the extreme east."

Recent Plant Portraits.

PHAJUS COOKSONI, *Gardeners' Chronicle*, March 29th; a handsome new hybrid, with nankeen-colored flowers, flushed with pink, raised from *Phajus Wallachii* and *P. tuberosus*, the former being the seed parent.

CITRUS JAPONICA, *Gardeners' Chronicle*, March 29th.

BEGONIA ADONIS, *Revue Horticole*, April 1st; a new winter-blooming hybrid of French origin.

Botanical Magazine, April:

PRESTOEIA CARDERI, t. 7108.

SICANA SPHERICA, t. 7109.

PELIOSANTHES ALBIDA, t. 7110.

IRIS ORCHIOIDES, *t.* 7111; a native of central Asia, and nearly allied to *Iris Caucasicus*, which differs from it in its dwarfer habit, by its thickened leaf margins and paler yellow flowers.

VANDA KIMBALLIANA, *t.* 7112; a beautiful and now popular Orchid, the secret of whose native country has been carefully preserved by the introducers, Messrs. Hugh Low & Co. Its nearest ally, *Vanda Amesiana*, is said to be a native of India.

Notes.

Over 200,000 acres of Florida land are said to contain deposits of phosphate. Much of the richest rock can be mined for twenty-five cents a ton.

The annual banquet given by the Trustees of the Missouri Botanic Garden in honor of Henry Shaw, the founder of that establishment, will take place in the Southern Hotel, in St. Louis, on the evening of Monday, May 26th.

It is encouraging to learn that at a recent meeting of the Colorado State Horticultural and Forestry Association two of the subjects which were most earnestly discussed were "The Ornamentation of School Grounds" and "Horticulture and Entomology in the Schools."

Two of the English horticultural papers just received speak with enthusiasm of hanging baskets filled with *Lachenalia pendula* now in bloom. The drooping habit of this plant both in foliage and flower, and its simple requirements (see vol. ii., pp. 28 and 30), fit it admirably for this use.

Mr. E. Tidmarsh, Curator of the Botanic Gardens at Grahamstown, Cape of Good Hope, writes that the cottony cushion scale, so destructive to Orange-groves in Australia and California, is probably a native of Madagascar. Missionaries report that it has preyed upon Lemon-trees there from time immemorial.

Mr. A. H. Curtiss, in the Jacksonville *Times-Union*, advocates the planting of the Camphor-tree in Florida in view of the increased demand for camphor as a necessary ingredient in the smokeless gunpowder which is likely soon to come into general use for purposes of war. The recent increase in the price of the gum suggests the idea.

This has been a successful season for nurserymen in California. Orange-growers have been forced for several years to depend largely on Florida stock, but the frosts this spring killed the young trees in Florida. The large acreage of Orange-groves planted last fall consumed all the local trees, and now there is a call for 120,000 Orange-trees that cannot be filled.

Monsieur Froebel, the well known nurseryman of Zurich, calls attention, in the *Bulletin De la Société d'Horticulture d'Genève* of Rose-growers, to the value of *Rosa laxa* as stock in the place of the Dog Rose, *Rosa canina*. Monsieur Froebel finds that *Rosa laxa* does not send up suckers, that its branches are very vigorous, almost destitute of spines and lateral branchlets, that the wood is hard with very little pith, and that the plants are exceedingly hardy.

Monsieur André, speaking in a recent issue of the *Revue Horticole* of the new seedling varieties of Clivia, which are just now attracting much attention in Europe, declares that none of the recent seedlings surpass or equal, perhaps, these four old varieties, Madame Van Houtte, Marie Van Houtte, Lindeni and Van Houttei. It is hard to believe, however, that they can equal some of the varieties which have lately found their way into commerce through the English nurserymen, notably Grandiflora and Veitchii, which are both certainly exceedingly fine in foliage and in the size and color of the flowers.

According to *L'Horticulteur*, there are one hundred and five gardens or squares in the city of Paris. About a million plants are used every year in their decoration, including 300,000 Geraniums, 60,000 Begonias, 33,000 Forget-me-nots, 33,000 Ageratums, 26,000 Azaleas, 7,000 Hyacinths, etc. These gardens are under the direction of Monsieur Laforcarde, the head-gardener of the city, who employs four hundred workmen in keeping them in order; the annual expenditure being only about 800,000 francs, which seems a very small sum in comparison with the amount spent in the care and decoration of the public gardens in this country, notably in Boston.

A bulletin issued by the United States Department of Agriculture contains a list of the horticulturists employed at the various stations, with notes regarding the work they have undertaken. Forty-two stations are named, but with regard to twelve no information is given. At seventeen stations, it is announced, special attention will be given to questions of synonymy; at two seed-testing will be systematically pursued,

and in several the improvement of native wild fruits will be one of the chief aims. Plant diseases will be generally studied, and new varieties of fruits and vegetables tested. Cultivators are asked to send in such varieties in order that their value may be ascertained.

A public meeting for the purpose of increasing the interest in Arbor Day and in forestry generally was held on Saturday, in the large hall of the Museum of Natural History, under the auspices of the New York State Forestry Association. General Viele presided, and B. E. Fernow, Chief of the Forestry Division of the Department of Agriculture, made the principal address, which was an admirable statement of the reasons for restoring and preserving the forests of the country. Other addresses were made by Col. Balch, Professor B. G. Northrup, Professor D. S. Martin, Chancellor McCracken, Doctor Stephen Smith and William Potts. The attendance was by no means as large as it should have been.

A Paris correspondent writes that the Perpetual Carnation Marguerite is being much talked of in the horticultural world. It appeared in France last year and a bed of it could be seen in the Trocadéro gardens during the exhibition. It belongs to a race of Carnations which, it is said, originated in Italy. Its principal merit is that it flowers the first year from seed. Seed sown under glass at the end of February give plants which, after having been pricked out, commence to bloom at the end of June and continue to give flowers throughout the summer and autumn. Indeed, it is said that the flowering season can be prolonged into the winter if the plants are taken to a cool greenhouse or placed in a frame. The Marguerite Carnation forms dwarf tufts about fifteen inches in height; its stalks are rigid, and their excellent habit recalls that of the so-called "Tige de Fer" Carnations. The flowers are large, well-formed and agreeable in odor; the petals are fringed, and, as regards color, show all the tones between pure white and brilliant red. Different varieties exist as self-colored, blotched and striped.

The *Gardeners' Chronicle* recently published a picture of a curious Chrysanthemum sport which appeared on a plant of the Source d'Or variety grown by Mr. Maries, of Lytham. One half of the flower-head consisted of "yellow, flat strap-shaped florets; the other of dark golden bronze florets, revolute at the edges. Such cases are always interesting and are susceptible of various interpretations. That which seems most plausible in this case is, that the appearance is due to the unmixing or separation of previously blended components. In the case of the Chrysanthemum, which has been crossed and recrossed and crossed again, for an untold number of years, it is evident that the breed must be very mixed indeed, and there can be little wonder if a 'return to first principles' occasionally occurs." This theory, added the *Chronicle*, is not susceptible of actual proof in the case of the Chrysanthemum. But it can be proved with regard to a sport of Veitch's Calanthe, of which an illustration was likewise given. This plant is known to be a hybrid between *C. rosea* and *C. vestita*. The diverse features of the parents are, as a rule, thoroughly blended in the hybrid, but in the single blossom in question certain features of each parent were combined in scarcely altered shapes.

The tariff discussion has brought out some interesting facts with regard to Flax production in the United States. More than a million acres in our northwestern states are annually planted with the Flax plant, but very little linen cloth, and that of the coarsest quality, is made here. A few mills are engaged in the manufacture of twine and thread from the fibre, but the Flax is chiefly grown for the seed, of which some thirteen million bushels are produced each year. The crop is raised on new ground, the seed being thinly sown, and, without cultivation, bearing a heavy yield of seed. When this is ripe the plants are cut by horse-reapers, the seed threshed out by a machine, and the straw burned on the ground. The fact that Flax is not grown here for its fibre is laid by some to the account of our climate as being too dry and hot for its best development, but by others to the great cost of cultivating the plant with such an end in view. In Europe each farmer devotes but a small plot to Flax, prepares the soil as carefully as for a garden-bed, sows the seed very thickly, and keeps the crop nicely weeded. The plants, coming up closely, grow tall and branchless, developing the fibre at the expense of the seed, and they are pulled up by the roots before the seed ripens. After this the fibre must be extracted on the farm by laborious hand processes, as it costs too much to send the Flax in bulk to the market. It will be easily seen that, even were our climate propitious, American farmers would be slow to engage in such a time and labor absorbing industry.

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The Spring Garden.

IN these early May days the spring garden at the north, if it has been skillfully planned, is unfolding its choicest treasures, and is yielding a pleasure more intense than any which the wealth of flowers, the luxuriance of foliage or the fragrance and beauty of ripened fruits will bring as the season grows older. No later flowers cause such genuine delight as that with which we welcome the harbingers of spring. This is not altogether on account of their intrinsic beauty, although many of them are strangely fair; nor is it yet because they have so few rivals and occupy the field comparatively alone. Perhaps a stronger reason for the appeal they make to the imagination is the promise which they bring of a revival of life at hand—a promise especially cheering after our long and dreary northern winters. Besides this, there is a singular delicacy and fragility about those which first venture out into the wild weather, and this takes hold upon our sympathies. But whatever may be the causes of this universal manifestation, the fact remains that every one who has any admiration for flowers, or appreciation of them, is especially attracted by those which bloom out-of-doors in this early season. Many of these, like the Snowdrops and Winter Aconite, appeared before the grass began to show its first tender green, and now, when the branches of many of the trees are still bare, the spring garden is filled with flowers of the most delicate texture and richest color. Mere lists of plants are usually tedious, but a simple catalogue of even the commoner ones that have already flowered has a certain attractiveness. There is something akin to music in the very names of Anemone, and Scilla, and Primula, and Trillium, and Triteleia, and Uvularia, and Viola; and so there is in the common names like Snowflake, Wake-Robin, Grape Hyacinth, Fritillary, Wind-flower, Twin-leaf, Mitrewort and Violet. The variety of these flowers is almost endless. Collectors have ransacked all the temperate regions and high mountain ranges of the globe for

hardy, early-blooming plants, so that there is no place so pretentious that the spring garden cannot be made sufficiently elaborate and expensive to correspond with its other features, and there is no garden so modest that a corner of it cannot, with trifling labor and expense, be becomingly brightened with early flowers as beautiful as those borne by the most expensive rarities.

Now there are many persons who feel with each returning spring the charm which invests the flowering shrubs and herbs of the season, but the time for arranging the spring garden has then already passed, and later in the year when the bulbs should be planted, the beauty of the early flowers has faded from the memory and the matter is postponed until another year is lost. Of course, the proper time to begin garden work is now, in every instance. Plans cannot be laid too early. If a rock-garden is to be made—and many alpine plants will thrive better when their slender roots can find coolness and moisture in the deep pockets of well constructed rock-work than anywhere else—it is none too early to begin. Such a place can only be successful when the rocks are carefully placed, so as to check the flow of surface-water and allow it to percolate slowly into the soil between them. This soil must have time to settle and become compact, for any air-spaces mean dryness and death to root and plant. Another effective arrangement for a spring garden is where a southward sloping space of open greensward or a small lawn containing a few specimen-trees is surrounded by a shrub-border, and this border may again be surrounded by trees. These shrubs should be, as a rule, early flowering, with taller ones like certain of the Thorns, the Dwarf Apples and Lilacs on the outside, with Exochordas, Spiræas and Bush Honeysuckles and others of this size in front of them, and an irregular belt along the inner margin containing scattered groups of Azaleas, Daphnes, Andromedas, hardy Heaths and other low-growing shrubs. Between these shrub-groups may be set hardy bulbous plants and other perennials which bloom at the season. Such a garden can be made singularly effective when the curves which unite the turf with the border are gracefully laid, and when this margin is broken occasionally by some shrub like Van Houtte's Spiræa, set close to the turf, to relieve all appearance of formality by throwing its arched branches out upon the grass. A garden of this kind has already been described with some detail in this journal (see vol. ii., p. 277).

But no one need be deterred from projecting a spring garden because he can have no shrub-bordered lawn and no costly rock-work. One of the most interesting collections of spring flowers with which we are acquainted is in a city lot. It is interesting because its collector is a specialist who takes pains to find the choice species of Tulips, the most interesting forms of Snowdrops, Squills and Daffodils, and other early flowers; and because he cares for his own garden and has become an expert and an authority in spring flowering plants and their cultivation. When one has scarcely a square rod of ground there is room along the southern line of the house-foundation for many an early flower which needs its protection, and it must be a scanty lot indeed which will not furnish room for some clumps of the Poet's Narcissus. Novices should remember that the plants which flower next spring will have made every preparation to bloom the season before, and therefore the sooner herbaceous plants are in their places the better, while the bulbs will, as a rule, show better bloom if they are in the ground in early autumn. Those who are not novices will need none of these reminders, but to them we suggest the spring garden as a fascinating field of special study; and there need be no fear that this field is too contracted for a serious student. It will furnish ample scope for the most patient investigation. It is to the men who devote themselves to a single family of plants like the Primula or Narcissus to whom we look for instruction, and while they are adding to the sum total of horticultural knowledge they will find in the study itself its own ample and satisfying reward.

It is a matter of rare occurrence that names of botanists, often associated in scientific language with the names of trees, gain any real foothold in popular language. Magnolia, a name which commemorates the scientific labors of Pierre Magnol, a French botanist of two centuries ago, is a conspicuous exception in this country, and our great evergreen Magnolia is only known to the people living in those parts of the southern states where it grows as "Magnolia." The name of David Douglas is occasionally associated in British Columbia with the Fir-tree which he discovered, but "Douglas Spruce" can hardly be said to have established itself very firmly or very generally yet in the language of the people of any part of western America. Cases are less rare where the names of scientific worthies, perpetuated in the names of plants other than trees, are in common use; but trees, which are usually of importance to man or sufficiently conspicuous to attract his attention, obtain naturally local vernacular names before science imposes others on them, and the common names once engrafted on a language, almost always hold their own among the people of the country where the trees are found. It was a matter, therefore, of much interest and some surprise to hear recently, in western Florida, the *Torreya taxifolia*, one of the rarest of all our trees, spoken of generally as the "Torrey-tree"; and to find that Stinking Cedar, the unattractive name by which this tree was first known to the inhabitants of western Florida, was gradually being replaced by that of one of the Nestors of American botany. The reason for this change is found perhaps in the fact that this tree, from its rarity, the interest attached to the geographical distribution of the small genus to which it belongs, and the reverence which his successors have always felt for the name of John Torrey, has several times been visited in its remote and isolated stations on the banks of the Appalachicola by men of science from distant parts of the country. When the people of the region, therefore, found that men of mature years and apparently in the enjoyment of all their faculties had journeyed thousands of miles merely to look at a tree which they had always considered as valuable only because it furnished indestructible material for fence posts, their own interest and curiosity became aroused; and therefore hearing these eccentric strangers talking always about Torrey and Torreya, the name has gradually become fixed, and now "Torrey-tree" may often be heard in at least two or three counties of west Florida.

SIR DIETRICH BRANDIS offers the advice about the care of our forests, which appears in another column. If the voice of any man speaking words of warning on this subject is worth listening to, it is the voice of Sir Dietrich, or, as he is, still, better known, Dr. Brandis. No one better realizes the evils which follow excessive forest-destruction, or the possibilities of forest-administration. He it was who planned and successfully executed the scheme of forest-administration for India, one of the triumphs certainly of modern administrative genius. Forest-administration in India was established in the face of immense local opposition without the assistance of trained or adequate subordinates of any sort, and under natural and social conditions of great difficulty. The government forests of India were thirty years ago in as great peril as our own western forests are now, and the methods by which our forests are to be saved are very similar probably to the methods which Brandis put into execution, and which, at the end of a comparatively few years, not only secured the permanency of the Indian forests, but made them yield a large and steadily increasing income. No man who has yet spoken of our forests has done so out of such full knowledge of forest-conditions almost identical with our own, or with such extended knowledge gained in actual forest-administration, conducted on a vast scale and carried on under conditions which, at the outset, must have seemed well nigh hopeless to him and his friends.

Some Old American Country-Seats.

VI.—Hyde Park.

IN the days of the Revolution, Dr. Samuel Bard was a leading physician of New York. He was a decided Tory in feeling, yet he was a friend of Washington, and when the war was over, instead of migrating, he retired to a country house by the Hudson. He purchased his lands of the famous "nine partners," and named his seat in honor of Sir Edward Hyde, one of the Colonial governors of New York.

Hyde Park is to-day the name of a station on the Hudson River Railroad, the first stop above Poughkeepsie. The traveler who alights here looks in vain for any village, and after following the one road a little way, he finds himself beside a foaming waterfall, and sees beyond the stream a wide-spread and apparently unoccupied country-side, composed of woods, grass-lands, hills and vales, which he rightly conjectures to be Hyde Park proper. If the public road be followed as it winds up the valley to its junction with the old Albany post-road at Hyde Park Corner, and then the post-road be taken northward, the main gate of the park will be reached; but the park may also be entered from the river-side below the waterfall in Crown Elbow Creek.

A bridge, which leads to a landing on the bank of the Hudson, here spans the creek, and a narrow road enters the park in very modest fashion just beyond the bridge. Beginning at this gate, a belt of woodland stretches northward for perhaps a mile along the bank of the river, occupying the summits of the little crags and knolls which here make the rocky shore, and enclosing many charming bits of rocky woodland scenery. Parallel with the river, and just east of the wood, lies a gently hollowed valley of smooth grass-land, beautifully fringed by the waving edge of the dense wood on the one hand, and on the other rising with concave lines to meet the sharply ascending curves of a high, steep and grassy bank, which, with the great trees near its summit, bounds the scene on the east.

The little road which enters by the bridge commands one or two views of this bank and the long, green glade at its foot, and then it turns to follow the windings of the stream which comes dashing down over rough ledges and under shadowy Hemlocks on the right. The valley narrows until there is only just room enough for the stream and the road; and here a footpath breaks off to the left, and taking a rapidly rising open ridge, plainly indicates its intention to gain the summit of the high bank with the great trees which was lately in view. The road continues up the winding glen, passing by several pretty waterfalls; and, bye and bye, where the valley broadens and the stream is held back by a low dam, it joins the main approach-road, which here bridges the creek on its way from the Albany highway to the house. The united roads next ascend by one easy zigzag to a broad plateau of grass-land, set with numerous and variously grouped and scattered trees of noble age and stature, between the trunks of which the house soon appears in the distance. (See the picture on page 226.) This level ground is both wide and long, and its strikingly simple, open and stately effect is greatly heightened by the fact that from every part of it is visible in the west, beyond and behind all the massive tree trunks, an indefinite expanse of blue distance. When the house is reached, by the road just described or by the footpath before mentioned, it is seen to stand close to the brink of the plateau; in other words, upon the verge of the irregular, mile-long grassy bank the visitor saw first from below. The sudden descent of this bank, and the character of the trees upon it—chiefly old Chestnuts and Oaks—are shown in the picture on page 227. Some of the largest trees lean outward from the bank, and most of them grip the ground with a vigor befitting veterans who have long wrestled with the gales.

The view from the bank near the house embraces perhaps ten miles up and down the mighty river, with the varied opposite bank, and the wooded promontories near Staatsburg; and, in the far distance, the blue ridges of the highlands below Newburgh, the dark outlines of the Shawangunks in the west, and the pale summits of the Catskills in the north. Foreground, middle distance and distance are presented here with sharp definition. This is a scene not surpassed on the upper Hudson, unless the better composition of the river view from Ellerslie should place that wonderful picture first.

As the illustrations show, the house at Hyde Park is of a somewhat stiff and cold type; but it is simple and dignified, and in this respect is well fitted to its imposing site. Its south and west sides meet the grass of the park, its east side is the entrance front, and to its north-east corner is attached an ample kitchen and laundry yard, reached by a special road from the Albany highway, which, abreast of the house, has

gained the level of the upland. The stables stand apart a little to the north, and the greenhouses, with an enclosed garden attached to them, lie in a similar position on the plateau to the south. Both are entirely surrounded by the open groves of the park.

According to Mr. Downing, André Parmentier, of Long Island—the first landscape-architect who practiced in America—arranged the roads, buildings and plantations of the estate, under the patronage of Dr. Hosack, who succeeded Dr. Bard as proprietor. No man ever undertook a more responsible service in the realm of taste applied to landscape, nor one in which it would have been easier to fail by spoiling what nature had so magnificently provided. What a contrast is his work to the usual practice of the modern amateur, who, being a cultivated gentleman, considers himself quite able to lay out his own place. With the help of a jobbing gardener, he too often first despoils the natural scene of much that makes its character and beauty, for the sake of introducing supposedly decorative elements such as strange trees and the short lived brilliancy of flower-beds. Montgomery Place and Hyde Park should teach us better. The soft and tranquil beauty of the gentle landscape of the first named, and the broad stateliness of the upland scenery of the second, must impress all sensitive minds as no splendor of embellishment can. Decorative gardening, as it is often introduced in modern country-seats—that is, in patches scattered here and there—would at once kill the effectiveness of these old seats. Their power over the mind and heart consists chiefly in the unity of the impression which they make. Their scenery is artificial in the sense that Nature, working alone, would never have produced it; but the art which has here “mended nature,” to use Shakespeare’s phrase, has worked with Nature and not against her. It has, by judicious thinning, helped Nature to grow great trees; it has spread wide carpets of green where Nature hinted she was willing grass should grow; it has in one place induced a screen of foliage to grow thickly, and in another place it has disclosed a hidden vision of blue distance; and so, while it has adapted Nature’s landscape to human use, it has also, as it were, concentrated and intensified the expression of each scene. “Almost all natural landscapes are redundant sources of more or less confused beauty, out of which the human instinct of invention can, by just choice, arrange, not a better treasure, but one infinitely more fitted to human sight and emotion, infinitely narrower, infinitely less lovely in detail, but having this great virtue, that there shall be nothing which does not contribute to the effect of the whole.” Montgomery Place and Hyde Park on the Hudson may serve as illustrations of these good words of Mr. Ruskin’s.

Two other excellencies of these old seats remain to be mentioned so that they may perhaps be imitated. Firstly, the roads and paths, instead of displaying themselves and their curves as if they were the chief elements of beauty in park-scenery, are rightly made subordinate and inconspicuous, as befits the mere instruments of convenience they really are. When they run straight across level country they are shaded by trees in rows; when they curve, as they do only for good reason, formality of planting instantly stops. They lead to their objective points with directness and without superfluous flourish. Secondly, the makers of these old seats were wise in their generation in that they chose sites for their houses where ample space was obtainable and where fine trees already existed. Prevailing custom places fine houses on lots of land much too small for them, and many a mansion, architecturally excellent, is foredoomed to rise in some bare field where it must stand naked during many years. And yet, New England, not to speak of other parts of the country, abounds in accessible park-sites, crying to be occupied, where, if there is no such mighty river as the Hudson, there is great variety of lake, hill and mountain scenery adorned by fine trees and woods.

Boston.

Charles Eliot.

The Art of Gardening.—An Historical Sketch.

XX.—The Mahometans in Spain and India.

THE Generalif,* a sort of summer-palace attached to the Alhambra, stands on another spur of the same mountain. The walk from one to the other may be traversed in about a quarter of an hour, and leads through a ravine luxuriantly overgrown with Figs, Oaks, Laurels, Pistachios and Cystisus. The place, as Gautier described it fifty years ago,† wore the

aspect of a virgin forest; but it was once a carefully tended pleasure-ground, like the approach to the Alhambra on the other side, where natural effects had been simulated with consummate art. Much of the architectural beauty of the Generalif has perished, yet its gardens and water-works still delight the eye. Gautier says: “A marble bordered canal runs the whole length of the enclosure, rolling its rapid and abundant waters under arcades of foliage formed by massive and fantastically shaped evergreens. Orange-trees and Cypresses are planted on either hand. . . . The perspective is terminated by a gallery-portico with fountains and marble colonettes. . . . The canal makes a sharp bend and you penetrate into other enclosures ornamented with pieces of water and surrounded by walls. . . . In the middle of one of these basins opens, like an immense bouquet, a gigantic Oleander of incomparable beauty and vividness. When I saw it, it was an explosion of flowers, a veritable bouquet of vegetable fireworks. . . . The waters reach the garden by a sort of very steep inclined plane, edged with little walls, supporting channels of great hollowed tiles, through which the stream precipitates itself under the open sky. At each break in the descent the water rises in abundant jets from the middle of little basins, pushing its aigrettes of crystal into the thick foliage of the Oleanders which lock their branches above. The mountain ripples with water; . . . always one hears close by the murmur of some rivulet which is being led to feed a fountain or to moisten the roots of a tree.” Some writers say that this charming aqueduct was built as late as the time of Charles V.; but even if this is the case it represents a characteristically Moorish conception. The Oleander which so delighted Gautier is, according to others, not a single tree, but a massive group; its beauty, however, is always spoken of in terms as enthusiastic as Gautier’s own. It is, indeed, one of the “sights” of Granada; and still more famous is another feature in the gardens of the Generalif, a group of very large and ancient Cypresses—“Los Cupressos de la Reyna Sultana”—which have a traditional connection with one of the most sanguinary scenes in Spanish history. Every one has heard of the “massacre of the Abencerages,” a royal Moorish race; and it was precipitated by the fact, we are told, that in their trysting-place, beneath one of these huge Cypresses, a Christian king had surprised his wife with a Moorish prince.‡

Looking down from the gardens of the Generalif on one side “the hill disappears under an ocean of verdure,” while on the other there rises at a little distance a burnt, bare mountain throwing the more fertile scenes into incomparable relief.

In speaking of a convent not far away, Gautier says that the ancient Moorish garden had fallen into decay and wildness, but that he found an alley paved with white marble, flanked on each side by a long marble bench with a curved back, overarched with Oleanders of enormous size, and showing at the end of its long vista a magnificent panorama of the Sierra Nevada Mountains. This verdurous archway, with its marble *mastabah*, vividly recalls a description in the “Arabian Nights” of the approach to Haroun-al-Raschid’s “Garden of Delight” at Bagdad; and the fact is of interest as showing the essential identity of Saracenic ideas in all the widely separated lands where they found expression.

If the great palace at Zahra, near Cordova, built about the year 1000, still existed “we could afford to despise the Alhambra,”§ which represents a later and less admirable phase of Moorish art. The enclosing walls of this palace measured about 4,000 feet in one direction and 2,200 in the other. Like most Oriental buildings of the kind it consisted of a great number of apartments scattered about in gardens; and so rich were these gardens in marble kiosks, fountains and ornaments of every kind, as well as in plants and flowers, that “they may well have surpassed in cost and even in beauty” the buildings themselves, despite the 4,300 columns, the gilded roofs of cedar, the inlaid marble floors and the brilliant friezes of which the old historians tell.

Warlike tribes from central Asia early appeared in the west Asiatic provinces ruled by the Mahometan khalifs, Tartars coming first and Turks or Mongols later. They embraced the religion of the land and served for a time in its armies, but growing in numbers, they gradually gained one district after another for themselves. Before the middle of the thirteenth century pretty much all the ancient kingdom of Persia was in the hands of Ghengis Khan. His empire fell apart after his death, but a century later was consolidated by Tamerlane; and

*The name is properly *Ginut al arif*—“garden of the artist.” The place was created by the architect of the Alhambra, who afterward sold it to the king.

†“Voyage en Espagne.”

‡I venture to use the present tense in speaking of these trees, although I can find no recent account of their condition, and writers early in our century describe them as extremely old.

§Fergusson: “History of Architecture.”

then came new streams of Turkomans, until the history of the country almost disappears in a tangled web of conflict.

But when we follow these same invaders into the Indian peninsula, we find that, while apparently destroying Persia, they had absorbed the life-blood of its art. From the eighth to the thirteenth centuries there were constant Mahometan inroads into northern Hindustan. But the existing "Pathan dynasty" at Delhi was disturbed by the attacks of the great Mongol conquerors, Gengis and Tamerlane, and was succeeded by a Mongol dynasty, under whose most famous prince, Aureng-Zebe, Delhi rose to its highest pitch of splendor. Now, these Mongol rulers, whose dominion spread over a vast portion of northern India, were akin in blood not to the Persians or Arabs, but to the Chinese. Yet in India they used a thoroughly Saracenic art in their splendid buildings, and in their beautiful gardens, too. Not a trace of "Tartar" elements appears in their mosques, tombs or palaces; and the stately symmetry of their pleasure-grounds is utterly unlike anything that we find in the Chinese empire.

New York City.

M. G. Van Rensselaer.

New or Little Known Plants.

Paulownia Fortunei.

MR. HEMSLEY describes, in a recent issue of the *Gardeners' Chronicle*, a second species of *Paulownia*—*P. Fortunei*. This plant, it appears, was first collected by Fortune when he was in China, twenty or twenty-five years ago. His specimens, however, had no leaves and were confounded with *P. imperialis*.

"*Paulownia Fortunei* is readily distinguished from *P. imperialis* by its much elongated, heart-shaped, long-pointed leaves, glabrous and almost shining on the upper surface, with a very short and very dense whitish tomentum on the under surface. The flowers are longer and more curved, but I have no definite information of the color. The seed-vessel, too, is much larger than that of *P. imperialis*, as figured by Siebold and Zuccarini, but I have not seen a ripe one of the latter. So far as I know, *P. Fortunei* has only been observed, or at all events collected, in the two distant provinces of Kwangtung and Shantung, the actual localities being separated by about fifteen degrees of latitude. I have seen specimens of *P. imperialis* from Ningpo, which is situated on the coast about midway between the two places where *P. Fortunei* has been found, and Dr. Henry collected it in the central province of Hupeh, where, he notes, he observed it wild in various mountain localities. It is surprising that these two species should so long have been confused, though this probably would not have been the case had the common one proved a satisfactory ornamental tree in this country, and developed its full beauty. *P. Fortunei* produces its flowers early in the season, before or at the same time as the leaves; therefore we cannot hope that it will prove more suitable to our climate than *P. imperialis*."

In the neighborhood of this city *P. imperialis* is a familiar object, growing to a large size and adapting itself perfectly to our soil and climate. Further south, especially in some parts of Virginia and Carolina, it has become sparingly naturalized and is now found growing spontaneously among the indigenous forest-trees. It is probable, therefore, that the second species may thrive in some parts of the country at least.

Foreign Correspondence.

London Letter.

THE Daffodils may be classed with the Primrose, the Violet, the Wood Anemone and Hyacinth as typical English spring flowers. It is only within the last twenty years that the whole genus *Narcissus* has sprung into the very front rank as a popular garden plant, although Sir John Hill wrote in the year 1757 of the Poet's *Narcissus*: "The garden does not afford in its kind a prettier plant than this; nor do we know one that has been so early or so honorably mentioned by all kinds of writers." That the genus had attracted the attention of specialists long before what may be called the present revival of their culture is shown by Parkinson in his "*Paradisus Terrestis*," published in 1629, which contains figures and descriptions of nearly 100 kinds of *Narcissus*.

Although it is true that for a long time these plants were neglected by horticulturists generally, yet there have always been admirers sufficient to prevent their disappearance, and even to raise new kinds, so that few of those which Parkinson described have been lost. The attention of the present age has been directed to them by exhibitions, illustrated monographs and popular treatises upon their character and culture; probably also the fickle goddess Fashion has looked with favor upon them. Be the cause what it may, the Daffodils are now universal favorites, and where one grew them ten years ago a hundred grow them now.

The flowers rank second to none for decorative uses, and there are thousands of acres devoted to the cultivation of Daffodils for the supply of the London market alone. What flowers are best for the embellishment of rooms is a question which individual taste decides, but in my opinion there are no flowers, neither in summer nor autumn, nor yet amongst exotics, which excel the Daffodils as decorative flowers. They are abundant, they travel well, last a sufficient length of time; they are elegant, varied in color and in form, and many of them are deliciously fragrant.

If these plants are as popular in America as they are here all this is superfluous, but I am told that the passionate love of the English for Daffodils is peculiar to them. Messrs. Ware, of Tottenham, sent last year to the Paris Exhibition one of the finest collections of *Narcissus*-flowers ever shown, but, except *N. poeticus* and its varieties, it attracted little attention, and the exhibit was voted a failure!

The principal growers of these plants and the writers about them are Herbert Leeds, Backhouse, Nelson, Barr, De Graaf, Baker and Burbidge. Two of the very finest kinds—namely, Emperor and Empress—were chance seedlings raised by Mr. Backhouse. Leeds raised many beautiful crosses between the Trumpet and Poeticus sections, "which rival the choicest of all tropical Orchids in beauty, while at the same time they are perfectly hardy in our gardens." De Graaf has given us some magnificent seedlings, two of the very best being Beauty of Leiden and Madame de Graaf. In our opinion this last named is the most perfectly beautiful of all the Trumpet Daffodils. It is large, regular and elegant in form; the trumpet has an even, crisp, reflexed margin, whilst the color is soft, creamy white. Another sensational kind is Sir Watkin, the history of which is quite a pretty little romance. Its origin does not appear to be known. Its flower is of gigantic proportions, and its color is canary yellow with an orange-yellow trumpet.

In the face of the fact that there are no less than about five hundred named varieties of *Narcissus*, it is not easy to make a selection of a few which can be called the best of the lot. We have more names than distinctions; that is quite certain. The Royal Horticultural Society recognized this when they appointed, in 1886, a select committee to deal with the nomenclature of the genus. This committee still exists and finds plenty to do; more, in fact, than it can manage. Recently it has published a list of some fifty varieties of *Narcissus* which it considers are sufficiently well marked to deserve distinctive names. We had a great Conference and Exhibition of Daffodils in 1884, and another has just been held at Chiswick, extending over four days (from April 15th to 18th). The papers read at the Conference treated the botany, history, hybridization and crossing, the names and the cultivation of Daffodils of all kinds. With respect to the botany, that may be said to have been settled long ago by Mr. Baker, whose latest revision will be found in his recently published work on the *Amaryllidaceæ*. The history also has become an oft-told story. The only additional information yielded by the conference relates chiefly to matters of cultivation and improvement.

A paper on the cultivation of Daffodils for the supply of the London flower-market was read by Mr. James Walker, one of the most successful of those who grow flowers on a large scale. The gist of this excellent, practical paper was, in regard to soil, that a representative collection could not be grown well in the same soil. He planted a collection on a strong loam in 1881, and whilst some kinds increased fourfold in a year or two, others had died outright. He now divides his plants into two lots according as they prefer a heavy, well manured soil, or a lighter, less rich compost. He replants his bulbs every year, lifting them as soon as the leaves fade, drying and cleaning them, and replanting again in August and September, planting first those kinds which push new roots first. Mr. Walker insists on lifting, cleaning and replanting annually if first-rate results are expected. The kinds which he finds best for market purposes are:

TRUMPETS.—Emperor ("best of all"), Maximus, Golden Spur, Tenby and Spurius.

BICOLOR.—Empress, Horsfieldi, Grandis, Dean Herbert and J. B. M. Camm.

MOSCHATUS.—Of this white flowered group Mr. Walker did not speak highly, their flowers being too soft and not standing well enough for market purposes; he finds the following the best in this group, Mrs. Burbidge, Cernuus and Cernuus pulcher.

INCOMPARABILIS.—The best of all the many varieties included in this section is the giant Sir Watkin, and its nearest rival, Lady Watkin, of which Mr. Walker possesses the entire stock. Next to these he places Gloria Mundi and Princess Mary.

BARRI.—Maurice Vilmorin, General Murray, W. Ingram and Duchess of Westminster. The last named is large flowered, of excellent form and almost pure white.

BURBIDGEI.—The pick of this section Mr. Walker found in Constance, Falstaff, John Bain and Mary.

POETICUS.—All the forms in this section were, he said, of great value as market plants, whilst the best of them were Grandis, Recurvus and Poetarum. From the double-flowered kinds he selected Sulphureus (Codlings and Cream), Aurantius plenus (Butter and Eggs), and Telamonius plenus (Great Double Daffodil).

From this selection of kinds Mr. Walker is able to keep the market supplied with flowers from the end of January to the middle of May.

No one grows these flowers more perfectly or in greater numbers than Mr. Walker, who has close upon a hundred acres planted with them in his nursery near Petersham. His group of flowers at the exhibition was remarkable for its uniform excellence, not one of the hundred or so varieties it included being weak.

The principal exhibitor was of course Mr. Peter Barr, "King of Daffodils," as he is termed. Mr. Barr has done more than any one to bring Daffodils into popular favor, and he knows more about the cultivated forms than any other living man. He exhibited large groups of flowers of some two hundred named varieties and was awarded the gold medal of the Society. Kew sent flowers of one hundred and fifty named sorts. The great vineyard at Chiswick was filled with the flowers, and presented a most beautiful picture, such as had never been seen in any one place before.

W. Watson.

London.

Cultural Department.

Early Blooming Shrubs and Trees.

POSSIBLY on account of the unusual amount of snow on the mountain ranges west of the prairies our spring is late and but few ligneous plants are yet (April 25th) in bloom.

Of our indigenous shrubs under cultivation *Dirca palustris* (the Leather-wood) is first to expand its flowers, and our native Amelanchier (the Juneberry) follows closely and in advance of any of our varieties from Europe.

Of European and Asiatic plants some species of the *Prunus* family take the lead in earliness of bloom. A Manchurian Bird Cherry, *Prunus Padus*, expands its handsome foliage in advance of all our native and foreign species, and is now loaded with its really beautiful white racemes. As obtained from different parts of east Europe it runs into marked varieties. In beauty of tree and flowers a variety from Arel, in central Russia, excels all others I have yet seen.

Prunus virgata and *Prunus tomentosa* bloom with us at the same time, but are not equally hardy as to fruit-bud. While the tree itself is hardy enough, we rarely have the fine double flowers of the *P. virgata* in perfection. On the other hand, *P. tomentosa* is hardy in fruit-bud, and its blossoms will endure severe frosts.

The Siberian Apricot is now white with bloom, but it rarely fruits with us, as the flowers do not endure frosts or early spring storms as perfectly as do those of *P. tomentosa*, *P. Padus* and the Siberian Almond. In our climate the Siberian Almond (*Amygdalus Sibirica*) blooms with astonishing freedom and regularity. Three years ago it was loaded in early April with its pretty pink flowers during a frost that froze water an inch thick in a watering trough near it, yet the flowers were followed by a heavy crop of almonds, from which we grew hundreds of seedlings the next spring.

Of our collection of Barberries, *B. Thunbergii* and *B. Amurensis* come earliest into bloom, yet are not liable to be injured by frost or storms. *Forsythia suspensa* is now well laden with its yellow flowers, and, taken all in all, is the handsomest and best of its genus for our climate. Of the Elderberries, *Sambucus racemosa*, from Devil's Lake, Wisconsin, is in bloom with plants of this species from central Asia, while native individuals and those of west Europe are much later in flowering.

Of the Birches now in bloom, *Betula fruticosa* and *B. Gmelina* are the most interesting. The catkins are long, pendulous and peculiar, attracting much attention. Of the Willows now in flower, *Salix aurea*, of central Asia, is the most attractive. The long, yellow catkins, with the shining, half-developed foliage and bright yellow bark, give a pleasing expression not equaled by any Willow or Poplar in our collection. In the *Pyrus* family the wild Pear of the Altai Mountains is the most interesting. Its large, pure white flowers are in clusters at the points of growth, and form a fine contrast with the half formed silvery leaves. Worked at standard height on the common Pear of east Europe, *Pyrus salicifolia* forms one of our most desirable small trees of pendulous habit for the lawn. In a general way, I may add that eastern shrubs and trees of given species flower with us earlier than our indigenous plants. As an instance, *Prunus serotina*, from Massachusetts, blooms several days earlier than our native form of the species.

Agricultural College, Iowa.

J. L. Budd.

Notes After a Mild Winter.

THE unusual mildness of the past winter in the eastern part of America has again demonstrated some things regarding the plants of our gardens which have not infrequently come under the notice of horticulturists. The almost uniformly mild temperature (not touching zero at Boston) of the entire winter has been very favorable to many herbaceous plants which are ordinarily considered tender or but half-hardy. *Anemone Japonica*, with very slight protection, was quite uninjured, and the short stems of the rather tender St. John's Wort, known in England as the Rose of Sharon (*Hypericum calycinum*), with little protection, show very slight injury. It is among some of the woody plants that the effects of the mild winter are most noticeable. Most remarkable is the fact that our native trees and shrubs are rarely lured by warm mid-winter days into exposing their buds and blossoms to the frosts which suddenly and surely follow; but it is a common experience with many foreign species, natives of milder or otherwise dissimilar climates, that the flower-buds are pushed in mild weather beyond the limits of safety, and the result is that when spring comes the buds and half-opened flowers are dead. Here and there a few late buds escape and produce scattering flowers and perhaps fruit. In such cases one can imagine that the late blossoms developing into fruit might in the course of natural selection produce an acclimated race of the species; which having acquired the habit of late flowering, would not advance the buds too far until a comparatively safe season had arrived for expansion and development.

One lesson which has again forced itself on the attention of amateur planters is that soil and situation are often very important considerations affecting the vigor and endurance of some foreign plants. Even an exposed situation, where the soil is well drained, and not too rich, so that all parts of the plant become thoroughly ripened before autumn frosts, is apparently much more conducive to the hardiness of such trees and shrubs than when they are planted in rich, moist soil, where growth is continued until late in the season, and, in consequence, the plants are not fully matured and at rest before all activity is violently stopped by cold weather.

The Altheas (*Hibiscus Syriacus*) and the Weigelas are familiar plants which particularly illustrate the advantage of planting on a sloping bank or in a dry situation. In such positions they are usually as hardy as could be desired; but in rich, moist soils they are very liable to be killed to the ground. *Deutzia scabra* and its garden varieties and many species and varieties of Clematis are among the plants which are subject to severe injury in winter if grown in too wet and too highly cultivated situations. The buds of the tree Pæony (*P. Moutan*) are usually much advanced in the autumn, so that the leaves are plainly seen throughout the winter. These in some places have been killed, and it is noticeable that the injury is much less where the soil is warm and dry. The fragrant, early flowered, Asiatic Honeysuckles, *Lonicera Standishii* and *L. fragrantissima*, on low grounds lost most of their flower buds, and *Pyrus Japonica* sustained similar injuries except in much sheltered places. This plant, and the Honeysuckles to a lesser extent, are usually provided with some flower buds which are less advanced than the others, so that unless the stems of the plants are killed a few flowers are produced. The North American *Berberis* (*Mahonia*) *Aquifolium* is not a satisfactorily hardy plant about Boston; but here again a comparatively dry situation, added to a northern exposure with partial shade, gives the best result. Among plants which had many of their flower-buds killed

were the Forsythias, *Magnolia Lenné*, *M. stellata*, some Asiatic species of *Prunus*, and *Nuttallia cerasiformis* of the Pacific Coast. In all dry situations the Forsythias are as richly laden with blossoms as usual, but the buds were largely destroyed where the ground was wet, and similar effects were noted in comparing the early flowering small Magnolias.

On account of their precocious tendencies the pollen-bearing catkins of most of the foreign species of Hazels are usually destroyed before spring, and even the catkins of some of the exotic Willows shared the same fate during this mild winter. The frost did not penetrate far into the soil, and, coupled with the previous advantage of a damp summer, the past season was a very favorable one for the moisture-loving Rhododendrons and the Azaleas, and for the preservation of their flower-buds, although with few exceptions the buds of some extremely early flowering varieties were quite destroyed. With the protection usually given them, plants of *Calluna vulgaris* and allied Heaths appear to have suffered as severely this mild winter as they did in seasons with records of twenty below zero.

Arnold Arboretum.

J. G. Jack.

within the last ten years, and it is in bloom now. The racemes, five in number, are pendulous, two to three feet long, and bearing from fifteen to thirty flowers, each of which has a drooping pedicel six inches long, bearing a pair of large wing-like bracts four inches from its base, the flower being four inches across, and composed of four spreading sepals, five unequal petals, three of them large, and in the position usually occupied by the standard in the flower of an ordinary Legume. The stamens are united at the base, and form a long curved tube. The color of the whole flower, bracts, pedicel and all, is the richest vermilion or vivid scarlet, with blotches of rich lemon-yellow and a faint bluish tinge on the standard-like petals. In habit and foliage the plant resembles Brownea or Jonesia. The temperature supposed to be essential to this plant is from seventy to eighty degrees, with a bottom heat of ninety degrees, but the Kew plant is growing in a house devoted principally to Aroids and Tree-ferns, along with the largest of which it is planted out in an unheated but well-drained bed of soil. The temperature maintained in this house in winter is sixty-five degrees in severe weather, whilst in summer it ranges from seventy to eighty-five degrees. This is



Hyde Park: Entrance Front.—See page 222.

A Few Greenhouse Plants.

Amherstia nobilis.—It is now fifty years since this magnificent plant was introduced from India into England. Its fame had become known from a description by Dr. Wallich, who found it in 1827 in Martaban, growing along with *Fonesia Asoca*, another splendid-flowered leguminous tree. Writing of the Amherstia, Wallich said: "The largest of the two trees I found was forty feet high, with a girth of six feet near the base. Both were profusely ornamented with pendulous racemes of large vermilion-colored blossoms forming superb objects, unequaled in the flora of the East Indies, and, I presume, not surpassed in magnificence and elegance in any part of the world." Many futile attempts had been made to introduce this plant into English gardens before the Duke of Devonshire sent a collector specially for it, and succeeded in importing and establishing a plant in the famous Chatsworth Gardens. This plant is still alive. But the Duke was not the first to flower the Amherstia, a small plant in the collection of Lady Lawrence, at Ealing, flowering first in 1849. The first raceme that developed was sent to the Queen, and the second to Kew for figuring in the *Botanical Magazine*. A plant now in the Kew collection—originally, I believe, a cutting from the Ealing specimen—has produced a few flowers on several occasions

precisely what one keeps an ordinary stove at. Evidently, therefore, Amherstia may be grown and flowered in any house devoted to tropical plants. The Kew specimen is about ten feet high.

Aristolochia Goldieana.—In a genus remarkable for exceptional variety of form, size, color and odor, *A. Goldieana* is the most astonishing of all. It is the largest flowered of any known plant except the monster parasitic *Rafflesia Arnoldii*, which is peculiar to Sumatra; it is also very strong in form and very vile in odor. The tawny yellow or lurid purple color of the flowers and the possession of a strong disagreeable odor appear to be characters peculiar to all very large flowered plants, except, perhaps, the Victoria. Thus in *Stapelia gigantea*, the large *Amorphophalli*, *Godwinia gigas* and this *Aristolochia* we have these characters, namely, purple-brown and yellow, and an odor more powerful than pleasant. *A. Goldieana* was introduced into Britain in 1867, when a plant was received in Glasgow from the Rev. W. C. Thomson, a missionary in Old Calabar, who found it in flower "growing in a dry situation and surrounded with bush." This plant flowered in the Glasgow botanic gardens, and was figured in the *Botanical Magazine*, t. 5672. Probably all the plants of this species now in European collections are the progeny of this first introduced one. It has flowered several times within the last ten

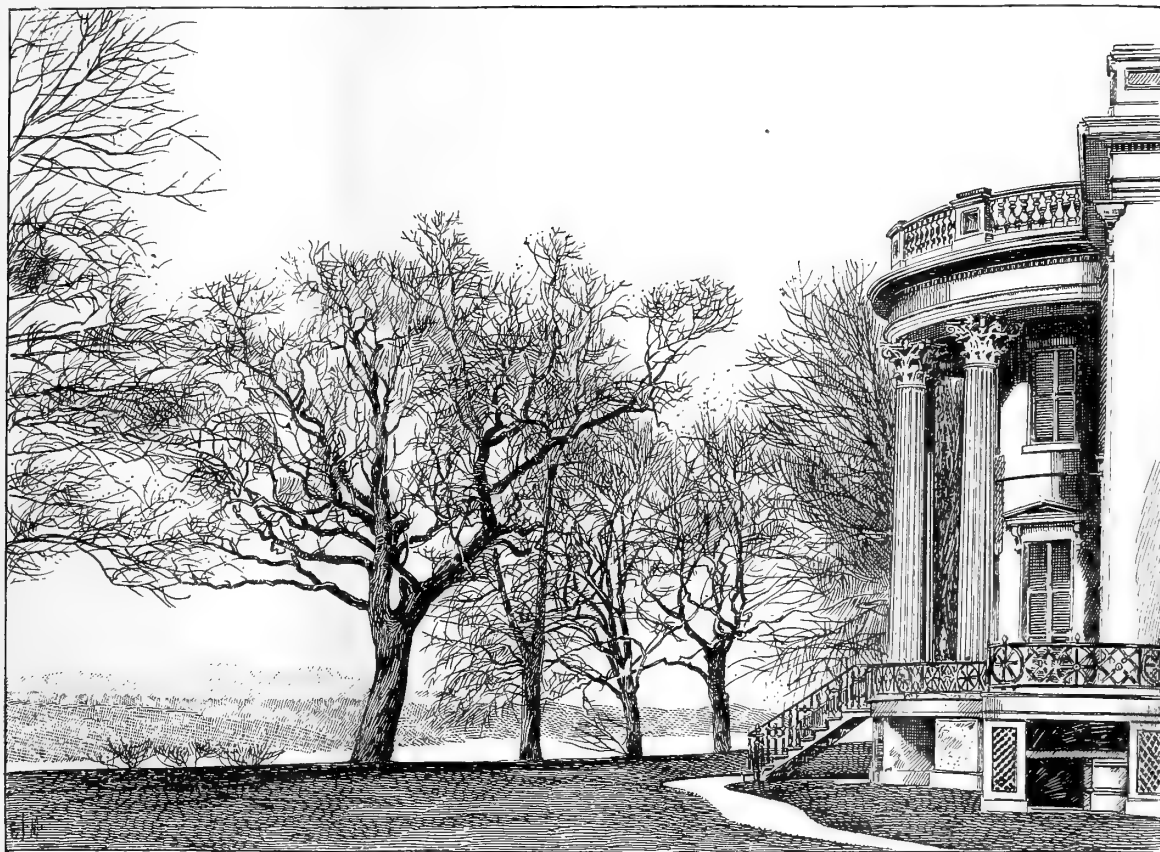
years in botanical gardens, notably at Kew, where a plant of it is in bloom now. The root-stock of this species is rather woody and it bears thick fleshy roots not unlike those of Dahlias. The branches are annual, pushing into vigorous growth in early spring and perishing in the autumn. In winter no water is given. The Kew plant was repotted at the end of January into a ten-inch pot. It was then placed in the hottest and moistest house in a position close to the glass. The flower-buds, when the plant is strong enough to flower, are produced at the base of the new growth and they show almost as soon as growth begins. They develop very rapidly and when expanded they are in the form of the Dutchman's Pipe (*A. Siphon*), twenty-eight inches long from the base to the apex of the limb, with a constriction and sudden bend at about a foot from the base. From this bend the tube gradually widens upward until at the mouth it is sixteen inches across and is large enough to almost completely hide a man's head if put on as a hat. The three lobes are defined by three tails about three inches long. The color of the lower half of the flower is yellowish green, the upper half dull yellow ribbed and

sub-horizontal branches and pendent, axillary flowers, each on a stalk three inches long, and in form, substance and color not unlike the flowers of the pretty *Clematis coccinea*; in other words, the flowers are fleshy, arceolate, over an inch broad, and of the brightest crimson color. W.

Kew.

Notes on American Plants.

SEVERAL of the Dog's-tooth Violets (*Erythroniums*) are now in flower, but by far the most charming species we have seen is *E. Hendersoni*, which was described and figured in GARDEN AND FOREST, vol. i., page 317. The flowers of this plant have colors as rich and delicate as those of the Calypso. Of course there is nothing fantastic in their shape, as is the case with the Calypso, but in their way they are quite as pretty. The plants seem to be healthy in this climate. Ours were protected during winter with a covering of leaves, but we think that if the bulbs are set six or eight inches below the surface they would be perfectly hardy. Another interesting species from Oregon was sent us under the name of *E. Howellii*.



Hyde Park: River Front.—See page 222.

veined with purple on the outside, the inside being dull orange-yellow marbled with purple.

It is difficult to convey a correct idea of the plant by means of a description, but when seen it cannot fail to astonish even those who are well acquainted with plants. For botanical collections it is a splendid subject, and even in private gardens it is worth growing, the unpleasantness of its odor being more than counterbalanced by its wondrous size and form. It is easily cultivated, the only time when it requires extra care being for about a week when the buds are very small, as at this time the slightest check causes them to fall, when all chance of flowers for that year is gone.

Crinodendron Hookerianum.—Although a native of the American continent (Chili), and an old introduction into English gardens, I venture to recommend this beautiful-flowered greenhouse shrub to the notice of your readers as a plant worth the attention of every one who delights in distinct, elegant, bright-colored flowers. Veitch introduced it into England many years ago, and tried to grow it outside, but failed. *The Garden* published a colored plate of it about ten years ago, but still it remains a rarity in cultivation. A plant now flowering at Kew is one of the prettiest little objects. Imagine a *Vaccinium*-like plant, eighteen inches high, with

This has smaller, light cream colored flowers, slightly tinged with red, with a yellow centre. Both species thrive in a loamy soil in open sunlight.

One of the most interesting Trilliums at this time of spring is the *T. sessile*. Not on account of its flowers, for they have not yet opened, but for its three large spotted green leaves. It seems to give the finest display of foliage of any of this genus. A bed of this species planted last August is now in full leaf, a solid mass of the deep green. Each plant has three leaves in a whorl, and on the finest specimens each leaf is fully three inches wide.

Erigenia bulbosa (Harbinger of Spring), now in flower, is a small and dainty little plant, seldom more than five inches high, with a tuberous root. Its flowers are in a compound umbel, small and white. It seems to like the shade, or at least to be slightly shaded.

Synthyris reniformis, from Oregon, is an early flowering plant. Its blue flowers are borne in a dense spike about an inch long by half an inch in diameter. The reniform leaf is notched around its entire margin. The plant grows only a few inches high and is quite interesting, not only on account of earliness, but for its foliage and flowers.

Corydalis aurea, a not uncommon biennial, is a valuable plant for cultivation. It forms large clumps or masses of its

fine pale green or glaucous foliage, four to six inches high, and often more than a foot wide. At this time of spring, half hidden among its foliage, may be seen its pretty golden yellow flowers. These continue to appear until past midsummer. There are few of our native plants which, when brought to their highest state of development, are more attractive. A well drained loamy soil and open sunlight are what it needs.

Trollius laxus (Spreading Globe-flower) is an inhabitant of dark, shaded swamps. Its pale yellow flowers are about an inch wide, and come in early spring before many plants appear above ground. This earliness makes it interesting, for at this season a plant might attract us that would not do so a month later. It needs a moist, shaded situation.

Shortia galicifolia, now in flower, is a plant that would interest any one even if its history were unknown. The foliage is as fresh now as at any time, and the flowers, which are nearly white, or of a slightly creamy shade, are delicate and pretty, half an inch wide. The plant seems to prefer shade, or to be partly shaded. A fine, loamy soil suits it, and it is not difficult to grow.

Southwick, Mass.

F. H. Horsford.

Hardy Plants for Cut Flowers.—III.

MOST gardens possess a sheltered corner that is well drained and warm in winter, and such a position should be utilized to plant a bed of *Alstroemerias*. These beautiful plants are natives of South America, and belong to the *Amoryllidaceæ*, but do not receive the share of popular attention which they deserve. They flower without intermission for several months when well established and left undisturbed. We have tried three kinds—namely, *A. aurantiaca*, with bright orange flowers; *A. Chilensis*, with flowers of various shades of white, pink and yellow; *A. Peruviana*, with crimson and green-tipped flowers. *Alstroemerias* have thick, fleshy, tuberous roots, which are produced from a creeping rhizome, and these penetrate deep into the soil in search of nutriment and are usually secure from frost in mild winters, but in severe seasons it is best to place some dry non-conducting material over the plants after they have died down. The flowers of *Alstroemerias* are very showy, and are produced in terminal umbels, and last long when cut or on the plants.

Of *Anthericum Liliastrum* there has recently been introduced a variety Major, which is the best of all *Anthericums*. It is an early summer plant, and dies down after flowering as the Oriental Poppy does, to reappear early in spring. The flowers are pure white, more than an inch across, borne on stout, erect stems, and in every way adapted for house decoration. The plant is often known as St. Bruno's Lily, and is perfectly hardy.

The graceful habit of *Aquilegias*, the length of time they last in bloom and their hardness are all strong points in their favor; it is a pity they are not more durable when cut; but their profusion compensates for this in a measure, and certainly a garden of hardy flowers is not complete without the Columbines. It is well known how prone *Aquilegias* are to mix, but we have long kept three of the best native species true by gathering the first seed to ripen and cutting off the last flowers of *A. Canadensis*, *A. cerulea* and *A. chrysantha*, which flower in the order named. We shall have to adopt some other plan in the future, owing to the introduction of some twenty aliens. A word should be said for the Munstead Giant, a fine, pure white strain of the old *A. vulgaris*, the best white variety for cutting, owing to the stout, erect stems, which are two to three feet high.

The *Spiræas* deserve notice, for all are useful, though some more so than others; *S. astilboides* is one of the best, and is of recent introduction. It has dense spikes of white flowers similar to those of *Astilbe Japonica*, but it is quite distinct and taller in habit. It is pleasant to record that what was once almost a craze for *Spiræa palmata* is dying a natural death in favor of *S. lobata*, a native plant, known as Queen of the Prairies, which is quite as beautiful as the Japan plant, with fragrant flowers, and with a constitution that will ensure its thriftiness in any position. The double flowered form of *S. filipendula* is useful also, and is much more durable than the single variety.

It is rather surprising that people plant year after year seeds of the annual Candytuft when they could plant a perennial species and always have something green to rest their eyes upon, for all perennial Candytufts are evergreen. *Iberis sempervirens* is now a mass of snowy blossoms; *I. Garreuxiana* comes next, and then *I. corrafolia*, the largest flowered kind, after which *I. sempervirens* commences to flower again, which it will do sparingly until fall. *I. Gibraltaria* has handsome foliage and flowers, but, unfortunately, it is not hardy here,

though it is valuable for cutting when protected in winter. These hardy kinds of *Iberis* succeed best under the let-alone system, for when once planted they do not care to be disturbed, and soon form dense masses of foliage.

Passaic, N. J.

E. O. Orpet.

Orchard Experiences.—IV.

HOW to set out Apple-trees has been a subject of discussion for a great many years, and yet many who have written upon it have failed to lay down definite principles of work, or to go into details in a practically instructive way. It has been shrewdly said that a physician is worth more to his patients for what he forbids than for what he prescribes. Very much the same might be said of our horticultural teachers. There are many superstitions about tree-planting that are hurtful in themselves, or because they divert attention from things essential. Some planters are very particular that the young tree should be set exactly as it stood in the nursery, as regards the points of the compass. Others have a notion that the roots must be kept near the surface, and they try to insure this by placing a flat stone in the bottom of the hole. Many beliefs of this kind might be quoted, all of little or no importance, and usually founded upon tradition or on the practice of men really expert but full of "notions."

The first essential is to have healthy trees, with a good supply of healthy and unmangled roots. The next is a proper place, properly prepared, in which to set them out. Hard-pan land, or land underlaid with ledge within six feet of the surface, is fatal to success. One of the finest young orchards I ever saw was set out over rock not more than five feet from the surface. It grew thriftily, but had hardly come into full bearing when a summer of unusual drought almost entirely destroyed it.

Not only are healthy trees, properly taken up, essential, but the selection of varieties is no less so. For a family orchard of small size fancy may be allowed to guide, but a commercial orchard must be selected with a single eye to the marketableness of its crop. Standard market sorts are what the commercial grower must have. The soil has to be considered, because some valuable sorts are grown to perfection only on certain soils. The Yellow Bellflower is worthless almost everywhere except near the banks of rivers, like the Kennebec, the Connecticut and the Hudson. The Roxbury Russet requires, for its full perfection, a soil charged strongly with iron. When this variety is set in rows running out from a ferruginous soil to one of different quality, its fruit immediately shows the change, being there far inferior in size, and defective in the chief merit of this profitable variety, its keeping quality.

The holes in which trees are to be set must be large enough to take in the full length of the roots, and they need not be larger on any land desirable for an orchard, which should be naturally or artificially well drained. On a well grown tree the roots are commonly more or less in whorls, one above another; and these should be spread out separately, beginning at the bottom. Every root must slant downward to its tip, which should be smoothed with an undercut where bruised by the spade in digging. The hole ought to be gauged as to depth, so as to leave the tree, when set, not more than an inch deeper than it was in the nursery; and the earth should be carefully and firmly compacted about every root to its end. Trees thus carefully and firmly set require no watering, and the use of water in setting is objectionable, as interfering with the proper compacting of the soil by the hands. The feet should be used for this purpose only after all the roots have been placed and covered; and in treading remember to keep the toes pointed directly toward the stem of the tree—otherwise roots will be broken, and sometimes torn off.

Staking is necessary only when the trees are tall, with thick heads; and these trees are not so good as smaller and younger ones, which need no stakes. Mulching, however, is of great service. A good mulch will double the rate of growth in a young orchard; and I have found it profitable to grow Beans in my young orchards in order to have the straw for mulching. Bean-straw will not be blown off by the wind, it decays slowly, and when decayed is a powerful fertilizer. If one begins with mulching, however, it must be continued as long as the orchard is kept under tillage, for it keeps the feeding roots of the trees quite near the surface. Another incidental advantage of a Bean-straw mulch is that it is not nearly as easily fired by accident, and if fired it burns slowly, and is easily extinguished by throwing earth upon it.

It is well known that many otherwise valuable varieties of the Apple have a tendency to suffer in the bark on the side

next the sun at its hottest—when a little past the meridian. The bark becomes hardened so as to interfere with its growth by compression, and sometimes it is killed outright. It has been advised to attach a slip of board to the trees on that side; but another way is to lean the tree in setting a little to the west of south, and also to encourage the growth of a few short branches low down on the same side. It is, of course, better to select varieties not so sensitive to the sun's action, or to use such sorts for stocks, to be top-worked. It is well to know and remember points like these, for success with an orchard requires a wide and various knowledge of all the needs and peculiarities of the fruits we want to grow. Probably the larger part of all the orchards planted fail of profit because their proprietors have not an adequate knowledge of the minor details which are essential to successful management.

Newport, Vt.

T. H. Hoskins.

Seasonable Hints.—Many vegetables which are highly esteemed in Europe are comparatively unknown in American gardens, partly because they are not so easily cultivated in our climate, but mainly because they have not been more widely tried. Globe Artichokes, Sea Kale, Cardoon, Endive, Feticus, Celeriac and such herbs as Tarragon and Borage would make welcome additions to the supplies of many a country home where now they are never seen. Seeds of the Globe Artichoke may still be sown, although this should have been done a little earlier. The young plants should be thinned out so as to give room for full development, and should be transplanted the following spring to permanent beds, in rows three feet apart and three feet apart in the rows. It would be better now to secure a supply of young plants and thereby save a year. In any event, they will not bear much the first season, but afterward they will produce a fine crop for years, although it is better to renew the plants every two or three years. They need a covering of coarse litter in the winter, as they are rather tender, and they should be set in a comparatively dry spot, as they are liable to rot from undue moisture. In June they begin to produce flower-heads, which should be gathered before they open, and when properly served will be found a great delicacy. Seeds of Cardoon may be now sown very thinly in rows three feet apart, and thinned later to eighteen inches between the plants. With ordinary cultivation the leaves can be tied up by the latter part of August, to promote a perpendicular growth, and then they should be earthed like Celery. The plants can be preserved for winter by trenching as for Celery, and they make fine flavoring for soups and salads. Endive is extensively grown by German cultivators, but is rarely seen in the gardens of amateurs. The seeds may be sown any time before July 15th, and the plants should be transplanted into beds about one foot apart each way. The simplest way of blanching them is to set boards along the rows when they are about half grown. The curled varieties make ornamental garnishing for various dishes and the broad-leaved variety is highly esteemed as a salad. The seeds of Celeriac should be sown at once, and as soon as of sufficient size, the plants should be set in rows eighteen inches apart, with six inches between the plants. They require slight earthing up, and by November will have formed bulbs like a small turnip, which is the edible part of the plant. About this time they should be dug up, and placed entire in shallow trenches, with but a small portion of the top appearing above the surface, and over this straw may be laid as cold weather sets in. The sliced roots make an admirable salad, and when grated dry, are useful for flavoring the finest soups. Plants of Tarragon should be secured at once and set in a sheltered situation. The young leaves are not only useful for flavoring in cooking, but when placed in vinegar they make a palatable and appetizing condiment. The blue flowers of Borage are not only ornamental, but they are much sought by bees for the abundant nectar they yield, while the aromatic leaves are particularly valuable as flavoring for salads, cooling drinks and light wines. The seeds may be sown now, and transplanted into rows eighteen inches apart and twelve inches apart in the row.

Bergen, N. J.

P. O.

Magnolia Kobus.—It has been said of this *Magnolia* that it does not flower until it reaches a large size. At any rate, the behavior of a large specimen here warrants the belief that it is most unsatisfactory in its flowering. It is one of the finest specimens in this neighborhood, being fifteen feet high and sixteen feet broad at the base, and fully developed on every side. It has been growing in its present position twelve years. Until three years ago I never noticed a flower on it. It then had two. The next year it had the same number; last year, four or five; this year, one. The white flowers come before

the leaves, but they are small and are not sweet-scented. As a large, finely formed shrub it is unexcelled, but sadly disappointing in its flowers. It is often called *Magnolia Thurberei* in American gardens.

Fothergilla alnifolia.—This shrub is rarely seen in collections, but it is valuable for its beauty at this time of the year. It forms a bushy shrub, with Alder-like, small leaves. Early in the season, before its leaves expand, it is clothed with heads of white flowers. They are clustered together in a dense spike, not unlike a small bottle brush. It is so distinct and pretty that it should be better known.

Corylopsis spicata.—This is another good thing now in flower, but a new one, comparatively. It also flowers before the leaves appear. The pendulous racemes of yellow flowers on the hazel-like stems give it a character unlike any other shrub. It will be valued as one of the first of shrubs to flower in the spring, and because of its thriving in any ordinary situation.

Germantown, Pa.

Joseph Meehan.

Recent Publications.

Forestry in North America.—I.

A Manual of Forestry. By William Schlich, Ph.D. Vol. I. London: Bradbury, Agnew & Co., 1889.

It may be doubted whether this book will find many readers in the United States at present. The forest question at this distance seems as hopeless as ever. We read of forest-fires which destroy immense areas of magnificent woods, and the wholesale cutting of timber. Laws, it is true, have in some states been enacted to prevent the destruction of forests by fire, but in most instances they have remained a dead letter. The Federal Government, as well as some of the states, own extensive areas of forest-land, but these areas are diminishing rapidly by encroachments, and timber speculators find means to cut and lay waste the public forests.

Excellent treatises have been published to show that, if the present waste is continued, the difficulties will be serious, that in the drier districts, if the forest on the hills is destroyed, irrigation will be impossible and agriculture will suffer. Eloquent speeches on the forest-question are delivered at the meetings of the American Forest Congress and at local forestry associations. The practical effect of all these efforts has hitherto been insignificant. The matter seems perfectly hopeless and those who work the forests at present are not likely to be influenced by Dr. Schlich's Manual.

And yet the matter is not hopeless. Facts are stronger than arguments, and the facts are on the side of those who urge that forest-operations must be conducted on a methodical plan. What, then, is the essence of good forest-management? Simply this, that forests shall be treated in such a manner that they shall furnish, not huge masses of timber all at once, but a steady, and, if possible, increasing yield every year. The growing stock of trees, which is the accumulated wealth of centuries, must not be destroyed, but must be made to reproduce itself continuously, and to yield interest in the shape of annual cuttings.

Other countries have been in the same position in which North America finds itself at the present time. In other countries, also, there has been thoughtless destruction of accumulated forest-wealth. It has given way to a methodical system of working, which, in the long run, has been found to be far more profitable than the old system of wholesale cutting. When in British India measures were taken in 1856 to assert and to enforce the rights of the state in the Teak-forests of Pegu, and to substitute a regular system of management for the old practice of cutting down everything that was salable, the timber traders and other merchants of Rangoon raised an outcry of indignation. What they demanded was permission to cut whatever suited them. Teak-timber at that time commanded a high price, the merchants offered to pay liberally for permission to cut, and they argued that it was better to accept the revenue that would thus be realized, than to attempt the hopeless task of making the forests produce a permanent annual yield of timber. Iron, they added, would take the place of wood in ship-building, the demand for Teak would diminish, and ere long it would be a drug in the market. A brisk timber trade during a series of years, while Teak still commanded a high price, would greatly stimulate the development of Rangoon, while the growth of that town would be impeded by the refusal to comply with their demands.

Such were the arguments of those who opposed the adoption of a methodical system in working the Pegu forests. Large and important interests were at stake and their arguments seemed unanswerable. The forests were the

property of the state and it rested with the Government to say what was to be done. The influence of the mercantile community was great, and for a time their arguments prevailed with the Government at Calcutta. Orders were issued to open the forests to private enterprise. Fortunately these orders admitted of delay, and after a time wiser counsels carried the day. In this manner has it been possible to carry out the scheme of working the Teak-forests of Pegu upon a systematic plan.

The result has been favorable beyond all expectation. Ever since 1856 the Teak-forests of Pegu have yielded a large annual out-turn of timber, increasing in quantity as well as improving in quality, and at the same time the demand for Teak-timber has risen steadily. This has stimulated the export from other ports. The quantity of Teak-timber brought into the market from all sources has increased enormously since 1856, and yet, owing to the increased demand, prices have remained high. The trade has benefited largely and the growth of Rangoon has been rapid and steady beyond all expectation. In 1856 the Teak-forests of Pegu were not closed. The full quantity of timber, which their condition justified, was cut and exported annually, but the work was arranged in such a manner that their productive powers were not impaired and that the capital value of these estates was increased instead of being diminished. Lastly, Government has derived a large and steadily increasing annual income from this source. This was a point of vital importance. A new scheme had been carried out in the teeth of great and powerful opposition, and there was good reason to apprehend that unless revenue was produced the new scheme would not be permitted to continue.

As it was, the experience gained in Pegu acted as a powerful stimulus to systematic forest-management in all provinces of the large British-Indian Empire. Here, as in Pegu, the duty of taking action devolved upon the state, and the government is now reaping the reward of these measures in the shape of a large and steadily increasing annual forest-revenue and a large and steadily growing capital value of its forest-domains. The success attained in the management of the Government forests has induced native princes and large landed proprietors to follow suit and to manage their woodlands in a similar manner.

If it once comes to be understood in America that good forest-management does not mean the closing of the forests, but working them with moderation and on a definite plan, that forest thus managed is a permanent and valuable investment, then, not the state only, but private proprietors also, will commence managing their woodlands in a methodical manner, instead of allowing them to be ruined.

In a late issue of one of the leading German forest-periodicals, Wilhelm Kessler, a Prussian forest-officer, gives an account of his journey through the forests of Mexico and the United States. He describes a large forest of the Monterey Pine on the coast of California, which is carefully protected by the proprietor. Again, in a remarkable and most interesting book on the forests of North America, just published, the author, Dr. Heinrich Mayr, now Professor of Forestry at the Imperial Forest School of Japan, mentions his rides through large areas of virgin forest, kept in reserve by timber speculators and carefully protected until their turn comes to be cut down. Here, then, we have the first beginning of regular management, consisting in protection and successive cuttings. The second step is thus to arrange matters that on the places where cuttings have been made, young forest, consisting of the valuable species, shall grow up, so that when the last piece of the old forest has been cut down, a sufficient area of second growth with timber of the kind and size required may be ready for cutting. These arrangements will be facilitated by the great reproductive powers which some of the more important American forest-trees possess. In that portion of his book which treats of the forests in the Atlantic region, Dr. Mayr gives an account of the manner in which the White Pine (*Pinus strobus*) reproduces readily from self-sown seed, wherever climatic and other conditions are favorable for its development. Regarding the Douglas Fir, the author states facts which show that under favorable conditions complete forests of second growth are produced from self-sown seed. Wilhelm Kessler, in the paper quoted, states the same for the Yellow Pine (*Pinus ponderosa*). Hence it will be possible, if due care is taken in arranging the cuttings and in the subsequent treatment of the forest, to secure the regeneration, by self-sown seed, of valuable woods. To this primary object the attention of all those who are engaged in forest-operations in North America should be directed. It is only by actual experience and by series of experiments conducted on a regu-

lar system that the question can be solved, how cuttings should be arranged and what treatment should be adopted in order to produce a complete crop of young trees of the particular kind desired. Such arrangement of cuttings and such system of treatment will, as a matter of course, be different for each kind of tree, and will also differ according to soil and situation. Nor will it be feasible in all cases to secure a renewed crop from self-sown seedlings alone. Nature must be assisted in various ways, by hoeing the ground or otherwise, and in many instances by sowing and planting, in order to attain the object aimed at.

To these matters the labors of foresters in Germany, in France and in other countries of Europe have long been directed, and the result has been that in these countries the art of managing forests has gradually developed into a profession, analogous to the profession of law or of medicine. The fundamental principles of jurisprudence are as plain and as easily intelligible as the fundamental principles which underlie the profession of a forester. The application of these principles, however, is a difficult and complicated business. Just as it requires much study to master the profession of a lawyer, so it is with forestry. Again, just as the profession of medicine is based upon many branches of natural science, such as chemistry, physics, anatomy and physiology, so also an efficient forester ought to be at home in mathematics, botany, chemistry, geology and other exact sciences.

Evidently, therefore, manuals are needed to facilitate the study of forestry, and the work of which the title appears at the head of this article is the first comprehensive manual of forestry that has appeared in the English language. The author, Dr. William Schlich, is one of two German forest-officers whom the writer, while Inspector-General of Forests in India, was permitted to engage for the Indian Forest Service. Before going out to India in 1866, Dr. Schlich had passed the examinations for the superior forest-service in his own country (Hesse-Darmstadt), he had been the pupil of one of the most eminent professors of forestry in Germany, the late Gustav Heyer, and he held a distinguished place among his fellow students. In India he was designated at an early date for important positions; he served successively in several provinces until he rose to the post of Inspector-General of Forests. This important position he consented to relinquish in 1885, in order to take up the appointment of Principal Professor of Forestry at the English Forest School which it had been decided to form in connection with the Royal Indian Engineering College at Cooper's Hill.

The first volume of the Manual contains the general and introductory part; in a second volume the author proposes to set forth in detail the different silvicultural operations; while the protection of forests, the utilization of timber and other forest-produce, the systematic arrangement of the plans for working and the financial aspect of forest-management will complete the work. Not the least of the advantages which will be gained by the publication of this Manual will be to settle the English forest terminology. When methodical forest-management was begun in India some thirty-four years ago, it was necessary to devise terms for matters connected with the treatment of forests for which, at that time, no convenient expressions existed in the English language. The technical terms which then were tentatively used, may now, through the publication of this Manual, be expected to receive general currency, while in some cases more suitable terms will be substituted for those originally used.

Bonn, Germany.

D. Brandis.

Correspondence.

Hardy Plants at Short Hills, New Jersey.

To the Editor of GARDEN AND FOREST:

Sir.—A few days of genial weather has brought rapidly forward the early spring flowers, and I found in Messrs. Pitcher & Manda's nursery many interesting plants in bloom. The hardy plant department of this establishment is at some distance from the greenhouses, on the main road near the railroad station, and the situation is well adapted to such a nursery, being rolling ground with various exposures, and sloping at one point to a small stream. One notices, on entering the grounds, that a long, wide border has been made along the highway and filled with an assortment of plants for the benefit of the public. Varieties of *Phlox subulata* (Moss Pink) brightened up the beds near the entrance with masses of flowers which entirely hid the foliage. Excellent plants for spring carpeting they are, though some of the reds are not quite pleasing. A *Phlox* of more recent introduction is the white

P. Stellaria, dwarf in habit and not so compact in bloom. The first flowers of the Iceland Poppy (*Papaver nudicaule*) were just expanding. This dwarf Poppy is a gem, but it is apt to exhaust itself by profuse blooming, so that it cannot be considered a true perennial. It is best treated as a biennial for early bloom. If sown early in the year it will bloom in late summer and again in the following spring. The single flowers are white, yellow and orange. The well known white-flowered *Arabis Alpina* is here growing finely in a level border, though usually considered at home on the rockery. *Hepatica triloba rubra* has a color effect similar to that of the reddish Pink (*P. subulata*). *Myosotis elegantissima*, a variety of *M. alpestris*, is compact, with light blue flowers. *M. sylvatica compacta* has the compact habit and the yellowish foliage dear to the lover of variegated things. Varieties of *Doronicums* in bloom show that *D. plantagineum*, var. *excelsum*, is far away the best of the family and one of the best yellow Composites. Harpur Crewe, before noted in GARDEN AND FOREST, is a garden variety of this species. *Dodecatheon Meadia* and the rose-flowered *D. Jeffreyi*, *Anemone patens Nuttalliana*, *Viola cucullata* and its white variety, the lovely little *Iris cristata*, and *Stylophorum diphyllum*, the Celandine Poppy, were a few native plants worthy of any border.

Lovers of Aquatics will be interested in a *Caltha palustris* with a large, very double Ranunculus-like flower. *Helonias bullata* is not one of the most attractive marsh plants; but its rosy purple spike of flowers is rather interesting. Among the Primulas in bloom was a good strain of Polyanthus, *P. Auricularis*, *P. farinosa* and *P. Peyritschii*, the latter a hybrid between *P. auricula* and *P. viscosa*, a deep rosy flower with a white eye. *Epimedium macranthum* is a charming Barrenwort, as seen blooming here in young plants; the stems delicate, foliage pleasing and white flowers very attractive. A marked contrast is *Geum triflorum*, with its scapes bearing three purplish red, closed flowers—a native curiosity. The white *Orobis vernus* and violet-blue *O. lathyroides* are two good spring Vetches. Other plants noticed in bloom were a double *Cardamine pratensis*, the Cuckoo Flower; *Iberis Gibraltarica*, the perennial Candytuft (is this reliably hardy here as reported lately in GARDEN AND FOREST?); *Corydalis nobilis*; *Stellaria Holostea* (Satin flower), white flower, neat foliage; *Veronica repens*, dwarf, deep blue flowers; *Ajuga alpina*, a neat rockery plant; *Iris nudicaulis*; *Pulmonaria officinalis* and *Polemonium reptans*, two good old border plants; *Actæa spicata*; *Wulfenia fragrans*; *Arnebia echtioides*, with showy yellow flowers; *Glechoma hederacea*, var., a neat, creeping plant with violet flowers, and useful in baskets, etc.

It was a pleasure to find such a variety of good flowers where, of course, no effort is made to show blooms, and to hear that the demand for hardy flowering plants is increasing; but it is to be feared that the demand is not a tithe of what it should be and must become when these attractive plants are more generally made known; and, it may be added, when the average gardener ceases to turn over every border in April and grub out all plant-life. The railroad to Short Hills runs through miles of our most populous suburbs, and is lined with handsome, detached villas, evidently the homes of country-loving, prosperous people. I had the curiosity to look from a not very fast running train for some color from hardy flowers, but in all the distance from the city, with the exception of the blossoming fruit-trees, a few shrubs and a patch of *Phlox subulata* in a graveyard, not a glint of color from a hardy plant could be seen, though miles of well kept grounds were open to view. This seems to tell a pretty plain story about the limited distribution of spring-flowering plants.

New York.

G.

About Grafting.

To the Editor of GARDEN AND FOREST :

Sir.—I entirely agree with Mr. Burbidge when he says (page 158) that "Mr. Parsons does not go quite to the bottom of this question of grafting." There are many aspects of the problem which I should like to see illumined, and I was disappointed because Mr. Burbidge did not think it worth while to throw any new light upon the subject. He simply asserts that we do not know that grafting fruit-trees is better than growing them on their own roots, because the two processes have never been tried side by side. Of course, by the same reasoning, we do not know that the trees on their own roots are better, and until Mr. Burbidge proves that they are, it might be prudent for him to modify his absolute condemnation of grafting. If Mr. Burbidge proves anything by the assertion that "Nature is ahead of the most successful gardener, and she does not graft her productions," he proves too much, because the same argument would condemn layering, growing from cuttings, and even the

transplanting of seedlings, for Nature does none of these things. And what is the bearing of the statement that the Seckel Pear was not grafted, but was a chance seedling? Has any one advocated grafting as a means of securing new varieties? If we assume that Nature produced the Seckel Pear this means that out of the millions of natural seedlings one individual has proved of supremely good quality. But how long would it take Nature to produce an orchard full of Seckel Pears? If the variety had not been perpetuated by grafting and budding, Mr. Burbidge would probably never have tasted one. But as a matter of fact Nature did not produce the Seckel Pear. The seed from which the tree sprang was undoubtedly produced from varieties which man had been improving for centuries by selection and perpetuating by grafts.

Flushing, L. I.

S. B. Parsons.

A Large Purple Beech.

To the Editor of GARDEN AND FOREST :

Sir.—In your issue of May 8th, 1889, there was an interesting article upon a noteworthy Purple Beech upon the Lyman Place, Waltham. In that article it was said: "It would be interesting to know if there are large or very fine specimens of the Purple Beech in the neighborhood of this city or Philadelphia." A few days since I visited a Purple Beech on the grounds of Mr. Wm. H. Dyer, of Johnston, Rhode Island, which is certainly a fine tree. The tree was set in its present location in 1829 by the father of the present owner, Mr. Daniel P. Dyer, who was one of the pioneer tree-growers of this state; and he beautified his own grounds, as well as those of many of the fine old estates of Providence and vicinity, with some of the choicest kinds of trees which will grow in this climate.

The Beech alluded to is notable for its symmetry, presenting, in leaf, an almost perfect mound of dark purple foliage. Its dimensions, as ascertained by careful measurement, are as follows: Spread of limbs in two directions, nearly right angles, seventy-four and sixty-eight feet respectively; height, fifty feet, nearly; circumference of bole, three feet from the ground, ten feet four inches. At five feet from the ground, where the main stem divides into three parts, it is eleven feet in girth.

The tree is now in vigorous condition, and promises to grow much larger if it does not split apart at the place of its triple division, where it is now secured by iron bolts.

Near by this tree is a beautiful Cut-leaved Beech of large size, and a *Cladrastis lutea*, forty or more feet high, and of wide spread.

Providence, R. I.

L. W. Russell.

Evergreens Destroyed by Fire.

To the Editor of GARDEN AND FOREST :

Sir.—All persons do not realize that evergreen-trees are very liable to injury from fire when grass, leaves or other litter is permitted to burn in their vicinity during a dry time. Last spring a fine Norway Spruce hedge on the farm of the Wisconsin Agricultural Experiment Station was accidentally set on fire from a mass of burning leaves in the neighborhood, and before the fire could be extinguished several rods of the hedge were totally destroyed. The heat created was sufficient to seriously damage some fine shade-trees that were standing near. Last October, while visiting the orchards of Mr. A. G. Tuttle, of Baraboo, Wisconsin, I saw several fine groups of evergreens on his grounds suffer total destruction from fire through the ignorance and carelessness of some of his men who had been instructed to burn some brush in the vicinity. The fire ran through the partially dried grass that covered the ground about the trees, and as it approached their trunks, the dry needles beneath the trees, being resinous, burned so vigorously that the lower branches were ignited, and in a moment the fire crept up the trunk to the top of the tree, where tongues of flame rose higher than the tallest shoots. Whole groups of Norway Spruces, Balsam Firs and Scotch Pines, nearly or quite twenty feet in height, were destroyed in a moment by a roaring conflagration.

University of Wisconsin.

E. S. Goff.

Notes.

The shipment of California wines to New York for this year amounts to 150,000 gallons.

A winter-garden has recently been added to Craig-y-nos, Madame Patti's castle in Wales, at a cost of \$20,000.

The cable announces the death of Mr. Hugh Low, the senior member of the successful London nursery firm of Hugh Low & Sons, large importers and dealers in Orchids.

Carnations have been scarce and high priced during all of the late flower-season. They have ranged in price from \$2 to \$2.50 a hundred, when generally they are not over \$1 or \$1.25 a hundred.

In those portions of Spain where the Cork Oak (*Quercus Suber*) is abundant, it is said that the peasants use the cork to line their houses. Naturally it is an effectual protection against dampness.

Contrary to general prediction the season has proved an uncommonly productive one for Maple orchards in some states. A correspondent of the *Country Gentleman* estimates that the yield of Maple Syrup in the Western Reserve will reach 600,000 tons.

According to a Mahometan legend, Eve picked a four-leaved Clover as she was driven from Paradise. But the angel's sword touched her, and its leaves were scattered. One of them fell within the garden, while the others were blown outside. Hence the rarity of the four-leaved form and the luck which attends its discovery.

One of the recent introductions of Monsieur Lemoine, the famous horticulturist of Nancy, is a variety of Heliotrope which foreign journals declare to be more nearly white than any previously known variety, including the White Lady. It is a hybrid between *Heliotropium Peruvianum* and *H. incanum*, and has been named "Fleur d'été."

In many Austrian provinces the Christmas Rose (*Helleborus niger*) grows wild among the mountains, blooming in the month of February. But within the past few years such large numbers of the plants have been uprooted for exportation to other parts of Germany, to England and even to America that local journals deplore the prospect of its possible extermination.

The show of Tulips in the New York parks has been unusually fine this year. There have been no successors among them of the dull purplish flowers which prevailed last year, but a brilliant assemblage of clear red, yellow and white flowers. The circle at the Fifth Avenue entrance of the Central Park was especially gorgeous, and everywhere the blossoms appeared simultaneously and have lasted well.

The largest of the edible gourds tested by Dr. Harris is the Kampiyo, of Okayama, Japan, which grows a yard long and five or more inches thick, and in Japan reaches a weight of sixty or seventy pounds. The Japanese dry it before it is cooked; it may be sliced and fried like egg-plant, and is equal in flavor to a good squash. The plant is hardy, productive and without musk odor, and Squash bugs do not seem to be fond of it.

The *California Fruit Grower* says that a delightful syrup can be made from Watermelons by chopping them, pressing out the juice, and boiling it for several hours. The red coloring matter then coagulates, rises to the surface, and is skimmed off, when the juice remains "as clear as distilled water and of a pale amber color. Boiled a little longer, it thickens into a rich, fruity-flavored syrup, perfectly clear and the color of quince or apple jelly."

A writer in a German horticultural journal ventures the statement, for which he cites the authority of F. Cohn, that wild Grape-vines are sometimes found in the Maremma of Tuscany whose stems measure more than three feet in diameter, and adds that they can be found of still larger size in the Caucasian Mountains. The largest Grape-vine in cultivation, the famous one at Hampton Court, is only thirty inches in circumference at three feet above the ground.

We have already noticed the manufacture of cloth from Pine-needles as a promising young industry in some of our southern states. A correspondent of the *Atlanta Constitution*, writing from Wilmington, North Carolina, says that at a factory in a neighboring village may be seen specimens of colored matings made from the "Pine straw," which are excellent in quality and also attractive in appearance, as the straw can be bleached to a fine creamy tint and readily takes brilliant dyes. But the machinery for making this matting lies idle, so great is the demand for coarse cloth for cotton bagging.

The *Interstate Grocer* calls attention to the danger which threatens the California dried-fruit industry from the dishonest methods employed by many shippers. Prunes, which the producer sells in boxes bearing a number that indicates how many fruits go to the pound, are repacked in deceptive ways; and old prunes which have been treated to give them a fresh appearance are mixed with the new. Old currants, too, are "steamed,

syruped, mixed, repacked and sold as new;" and, moreover, the shipping marks of reputable importers are forged on the fruit-boxes. Our contemporary advises retailers to weigh fruit carefully before purchasing, or, better still, to buy the prunes which come in sacks instead of those in boxes.

We have just received a sketch of the life and services to American horticulture of the late Peter Henderson, which was read before the New York Florists' Club by Mr. A. D. Cowan. One of the interesting facts brought out in this paper is that when "Gardening for Profit" was prepared Mr. Henderson was occupied with his business for sixteen hours a day and the book was written in the short noon intervals and in the small night hours. The author wrote lying on his back with his head bolstered up to rest his body while his active mind kept at work. We quote this not so much to show Mr. Henderson's industry and energy as to call attention to the fact that this most successful of all his books, and probably the most useful work on market-gardening ever published, was written directly from the author's personal and daily experience. Perhaps this will help to account for its high practical value.

Timber thieves had become so numerous in Burlington and Ocean Counties, New Jersey, that, a few years ago, a Timber Protective Society was established, which employed detectives to patrol the woodland tracts in many townships. Of late this precaution has been abandoned, and the thieves have again become so bold that fresh measures are being taken to combat them. A correspondent of the *New York Tribune* recently wrote: "A few days ago an owner paid a visit to his tract of Cedar swamp, a few miles from Pemberton, Burlington County, with the idea of having it cut and converted into lumber. From the outside the swamp seemed to be in good condition, but, on pushing through the underbrush a short distance, he was surprised to find that the tract had been stripped. Nearly all the best timber had been cut and carried off. Hundreds of tracts have been despoiled in this manner."

The hot-house peaches in market, although somewhat small in size, are of excellent quality and well ripened. They bring fifty cents each in the fruit-shops. Peen-to Peaches from Florida have been on sale for a fortnight; they are not of the best quality and have sold for twenty-five cents a quart. Black Hamburg and Muscat grapes sell for \$4 a pound; the Muscats are not as large as usual. Fine hot-house-grown Sharpless strawberries bring \$2.50 a cup, which contains sixteen berries, in spite of abundant receipts from the South. West India mangoes have just arrived, and being the first of this season's growth are very good, but not of a very large size; they sell for from seventy-five cents to \$1 a dozen. Porto Rico pines are just here; they are very much larger than the ordinary fruit, weighing from five to ten pounds each, and bring \$1.50 apiece. Grape-fruit will soon be out of season. More than twice the quantity has been sold here during the winter than during any previous year. The prevalent belief that it corrects malarial tendencies has largely increased its use.

Central Park is particularly attractive just now. The colors of the expanding leaves are quite as varied as those of autumn foliage, and the grass is unusually thick and green. Next to the Dandelions, which gem the turf everywhere, the most abundant wild flowers are the Spring Beauties, which, on some slightly shaded slopes, seem to have taken almost entire possession of the soil. In the natural wood, in the northern part of the park, there are great sheets of the cream-white flowers of Dicentra, and on exposed rocks the delicate panicles of the Early Saxifrage are opening in great abundance. For some cause the Dog's-tooth Violets, which usually bloom very freely in the park, show scarcely a flower this season. Many of the low-growing herbaceous perennials, which have been largely planted of late years, are now in flower, and masses of Moss Pink, Aubrietia, Rock Cress, Armeria, Stemless Gentian, Primroses, Stitchwort (*Stellaria Holostea*) or Epimedium can be found along almost any path or drive. In some places the masses are too large, glaring and obtrusive, but generally they are well placed. The stretch of Heather along the bridle-path near Eighty-second Street is particularly pleasing. Among the shrubs our native Spice-wood is blooming profusely; the Forsythias, especially those which were severely pruned last year, are doing fairly well, and Thunberg's Barberry is covered with flowers; but one misses the blaze of scarlet which the Japan Quince ought now to be displaying. This is one of the shrubs which has suffered from the open winter, as have the Hazels and Alders and the early-flowering Honeysuckles—*Lonicera fragrantissima* and *L. Standishii*.

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The Greendale Oak and Welbeck Abbey.

A PORTRAIT of the Greendale Oak, representing the tree as it appears to-day, is published on page 239. The Greendale Oak is familiar by name at least to most persons who take any interest in the venerable or otherwise remarkable trees of England. It was a tree of such unusual size 176 years ago that the then Duke of Portland laid a wager that he had in his park at Welbeck a tree so large that he could drive a carriage and four through a hole cut in the trunk. He won his bet and ruined one of the most remarkable trees in Europe, which, in spite of this barbarous mutilation at the hands of the noble proprietor of Welbeck, has continued to exist almost in the same condition that it appears to have been in 1775, when the drawing of it was made that was published eleven years later in Hunter's edition of "Evelyn's Sylva." Another portrait of the tree appeared in Hayman Rook's "Description and Sketches of Some Remarkable Oaks in the Park at Welbeck," a rare and interesting book, published in London in 1790. Rook states that the Greendale Oak was "thought to be above 700 years old; and that, from its appearance, there is every reason to suppose that it had attained to that age at least." He gives the following statistics of its size: Circumference of the trunk above the arch, thirty-five feet three inches; height of the arch, ten feet three inches; width above the middle, six feet three inches; height of the top branch, fifty-four feet. The tree has probably increased very little since these measurements were made just a century ago, although we have not, unfortunately, any recent authoritative measurements with which to compare them. The archway, however, has certainly been much narrowed by the extension of the bark round the edges of the cut since the Duke drove his carriage and four through it. Another portrait, somewhat idealized, of the Greendale Oak appears on the title page of Strutt's noble "Sylva Britannica," in which are gathered the portraits of the most venerable and most interesting trees of Great Britain.

The Duke, who ruined this fine tree to win an after-dinner bet, was not the only eccentric owner, to use a very

mild expression, of Welbeck Abbey; and to the late Duke belongs the somewhat equivocal honor of having spent more money badly on a country estate than any man whose operations are accurately known. He enjoyed the title during twenty-five years only, but he spent in that time at Welbeck not less than \$35,000,000. Money was never spent more foolishly or with less results, and much of it disappeared underground. An old high-road crossed the park within sight of the windows of the Abbey. The Duke did not like his privacy encroached upon, so he carried the road through a tunnel a mile and a half long and leading right under the lake to a point where it could not be seen from the mansion, and where the traveler was allowed to emerge again into the light of day. This tunnel, arched with brick, made water-tight with cement and lighted day and night with gas, was an expensive affair. But the Duke, having once got the taste for burrowing, kept at it until he had made a vast picture gallery 158 feet long below the surface of the ground, connected with a great underground ball-room and joined with the mansion by long subways. Other subways lead to a great underground kitchen and to the stable a mile away. The conservatories were all underground, too, and the tired and astonished visitor may wander for miles through passages lighted only from occasional bull's-eyes placed at a level with the surface of the ground. Great sums of money were spent in building. A new wing was added to the Abbey, which was flanked by a broad, flat terrace leading down to the lake, a long, narrow sheet of artificial water, with margins bare of vegetation and marked by formal edge stones. A mile from the house and between it and the gardens are grouped a number of great stone buildings erected by the Duke. He never drove and rarely rode, but his stables had accommodations for 200 horses. The riding-school, the finest in Europe, it is said, is roofed with glass, and is 385 feet long and 104 feet wide. Eight thousand gas jets are provided to light it in case it is ever used at night. A tan gallop, enclosed in brick and covered with glass, 1,240 feet long, in which horses can be exercised in bad weather, stands near the riding-school; and not far away are coach-houses and farm-buildings, a poultry-yard, a timber-yard with a saw-mill, the house of the manager of the estate, and a club-house with a reading-room for the use of the working-people. The kitchen-garden and forcing establishment occupy eighteen acres, surrounded with a solid brick wall eighteen feet high. There are miles of glass in this enclosure, and some of the best fruit-trees in England. Seventy-five men keep this garden and the grounds about the mansion in order, and the work is well done. It would be hard to find a garden in better order or one more productive of good crops of fruit and vegetables of the highest quality; but outside the garden there is little of real interest on the estate.

The old Duke was all alone in the world. There was no one to help him waste his millions or to enjoy the results he thought he obtained; no kinsman or friend was allowed to cross his threshold; the only people he saw were the workmen who built up and pulled down at his command, and kept delving deeper and deeper into the ground. When his time came to die it was not even at Welbeck that the messenger found him. Was there ever a sadder spectacle of misdirected energy, of wasted fortune, of fruitless striving! That most of the money spent at Welbeck by this eccentric old man was wasted, there can be no doubt; for Welbeck Abbey, in spite of the millions which have been lavished on it, is one of the least attractive of the great homes of England. The house is set down in a hole, close to the ugly, formal lake, and the only view it commands is across the lake, and this view is ruined by a pair of ugly copper gates standing right in the middle distance, without other support than that afforded by a low metal boat-house. The view of this part of the park would, without this blot, be fine, as many such English park views are fine, from the natural grouping of the old trees they contain, and from the great bands of

deer which enliven them. But apart from this one view across the park, there is nothing at Welbeck to delight the eye of the lover of Nature or of natural beauty. The architecture is cold and monotonous, and the trees are, as a rule, small and in poor condition. Welbeck, however, as it exists, affords one of the most useful object-lessons in Europe, for it shows as no other country-place can show that the mere expenditure of money, unaided by taste and judgment, is powerless to accomplish any results in landscape-gardening of real or permanent value; and no American can see Welbeck and all its ghastly splendors without finding cause of congratulation for the laws and customs of his native land, which make such establishments impossible here. Welbeck is the principal although much the least interesting of the four great estates created on what was once Sherwood Forest (see page 197), and known as "the Dukeries."

It is rather a remarkable fact, which perhaps some of our readers will be able to explain, that there is now nowhere in the United States any one distinguished for a knowledge of cultivated Roses. Rosarians, as they are called in England, are common enough there, and their patient researches and their zeal in gathering and disseminating knowledge about Roses has been of the greatest service in increasing the taste for the cultivation of the queen of flowers. It is hardly conceivable that the rose does not hold the first place among flowers in the affection of the people of this country. She must still be queen by right and by tradition, although some newer favorites, like the *Chrysanthemum*, may appear to press her hard for a time. No people in the world buy so many roses as ours, and although fashion and love of display may have something to do with the great prices often paid for these flowers in winter, a real love of roses for their own sake is the true reason of their popularity.

American florists grow roses, especially under glass in winter, to perfection, and the best products of their skill are hardly to be matched anywhere. One can be a good commercial grower of roses and yet have only a limited knowledge of a comparatively few varieties, and the professional florist from a business point of view need only know how to draw from these the best money returns. What is really needed, however, in the interest of horticulture here is some one with leisure and opportunity to take up and carry on systematically the study of Roses where Parkman and Ellwanger have left the subject. The field is an inviting one. The possibilities of Rose-culture in this country are great, and so are the possibilities of improving the various races of the Rose to meet the demands of the different climatic conditions in various parts of the country. What a tempting field California and our southern States offer to the enthusiastic rosarian! There is much to learn, too, of the possibilities of Rose-culture in the trying climates of the northern States. Certainly there is not now in American horticulture any other field where careful study is so much needed as in that offered by the Rose, and no other where intelligent investigation in the right spirit will find so little competition, or can do more useful work or earn for the investigator a more agreeable reputation.

The Mandioca.

IN an economic point of view the Mandioca, or Manioc, is one of the most important agricultural productions both of Brazil and Paraguay. It takes the place of wheat in the northern continent, furnishing the inhabitants with an abundant, cheap and nutritious breadstuff, yielding an enormous quantity of material all the year round. With this the people are independent of the rest of the world for food. Here, in Paraguay, I do not know how they could get along without it. Corn, or maize, as it is generally called, is indeed raised, but it is a somewhat uncertain crop, and needs more cultivation than the native Paraguayans are disposed to give to anything which requires care. Their chief article of subsistence, therefore, is this wholesome and easily raised root, which the laziest people on earth can have with scarcely any labor.

As found here, the Mandioca is of two forms or species, each of which has several varieties. One of these, which has borne various botanical names, such as *Manihot Aipé*, *Manihot palmata*, *Jaripha Læstingii*, and *Fathropha dulcis*, but called by the Paraguayans "*Manioca dulce*," is the most common. The other, known to the natives as "*Manioca brava*" (*Manihot utilisima* of botanists), is not so frequently cultivated, though it is often seen in the fields. The sweet Mandioca forms the principal article of diet of the common people, as its roots are entirely innocuous. They may be used as a vegetable for the table, equaling the potato or parsnip, which they much resemble. Boiled for table use, they are white, sweet and palatable. All foreigners take to them at once. They may be fed to animals in the raw state, and are greedily eaten by cattle without injury. They are full of starch; indeed, that is the ingredient which renders the Mandioca so valuable, and the roots are frequently used as is the potato in our own country, for the manufacture of this important commercial and domestic necessity. The roots are grated or ground into powder, and, after the juice is expressed, dried in the sun or on plates over a fire, and thus made into flour, which forms an excellent bread when baked. The Paraguayan method is to knead the bread with new cheese or ground rice, melted fat, salt, water, and a little coriander seed, prepare it in long cylindrical rolls or rings, and bake it in the rounded earthen or brick ovens, resembling huge ant hills, which may be seen in the rear of many of the houses. The bread thus prepared is commonly called "chipa," and is, at least when fresh, a delicious article of food. The native women make and sell quantities of it in the Asuncion market. In the town of Luque, on the Asuncion and Villa Rica Railroad, they are noted for the fine bread which is made of this flour, and the passengers eagerly purchase it from the women who offer it for sale. I have also seen pastry and sponge cake made of the flour as light and palatable as anything prepared from wheat flour, and I do not know why it may not serve all the purposes for which the latter is used.

If the ground powder is heated upon iron plates and partially cooked, it clusters into hard and irregular lumps, and forms the well-known tapioca of commerce, or, prepared somewhat differently, it becomes the article known in England as "Brazilian arrow-root."

The *Mandioca brava* does not differ much from the *M. dulce* in external botanical characters. Both are stout herbs, growing from five to eight feet high, branching and very foliaceous. Both have their flowers in short axillary racemes, the flowers small, purplish white and nodding, producing a capsular, five-valved fruit, and an acrid, milky juice. The leaves of both species are alternate, on long petioles, palmate, with narrow, deeply-cut lobes. The natives, however, readily distinguish the two species. *M. dulce*, they say, when questioned, has red stems, petioles and leaves, while those of *M. brava* are white. On examination, however, it will be found that this distinction will not always hold good, as *M. dulce* frequently has stems and petioles almost or quite white, while those of *M. brava* are not unfrequently reddish. A much better distinction lies in the shape of the stems, which, in the former case, are nearly or quite terete, while in *M. brava* they are more or less angled; and also in the angle at which the petioles of the two species spring from the stems, rising in *M. dulce* at a right angle, or even sloping downward, and in *M. brava* at an angle of sixty or forty-five degrees. After all, the only satisfactory distinction lies in the juices of the two plants. That of *M. dulce*, as already stated, is sweet and innocuous. That of *M. brava*, on the contrary, is poisonous. The juice of this species has been known to kill cattle if the roots are eaten in the raw state. If, however, the juice is thoroughly squeezed out, and the grated pulp dried, it may be used in making flour and bread, like that of the other species. Indeed, some of the people here tell me that they prefer the bread made from *M. brava* to that made from *M. dulce*. It makes a lighter bread, they say, but I cannot see much difference between them. In Brazil, I believe, the *M. utilisima* is most commonly used in making cassava bread and tapioca, but either species will produce the same result, and certainly *M. dulce* is much the safer of the two. Why two species so closely resembling each other in all external botanical characteristics, growing side by side in the same soil and under the same conditions, should develop such different active principles, is one of the vegetable mysteries which cannot be solved; but that they do is certain. I do not find that the roots of the *M. brava* are ever exposed for sale in the market, though those of *M. dulce* may always be seen in great piles upon the floors and benches of the market-house. The people evidently have a wholesome dread of the poisonous species.

The *Mandioca* is very prolific. It is grown from slips, and never from seed, so far as I have observed. All one has to do in order to get a field of it is to cut the stem into layers, as is done with sugar-cane, and stick the joints into the ground, where it readily sprouts. I am told that one plant will continue to send out roots for nine or ten years in succession, and even propagate itself in this manner, if not cut off. The roots, which are the only part of the plant used, are from one to two inches thick, and run just beneath the surface of the ground for two or three feet. They have a brownish coat, and a granular, white interior. For table use they are generally taken when about nine or ten inches long, or else broken up into pieces of this length.

Thomas Morong,

In the Bulletin of the Torrey Botanical Club.

The Redwood Forest.

IN size of individual specimens, the Redwood (*Sequoia sempervirens*) ranks next to its relative, the Big-tree of the Sierra Nevada (*Sequoia gigantea*), and the Eucalyptus of Australia; but if we take the average size of the trees and the density and extent of the forest into consideration, the Redwood is the grandest of the world's forest-trees. It belongs to the Coast Range of northern California. A few straggling groves only are to be found below Monterey Bay, and it does not extend far into Oregon. The largest body commences at the mouth of Russian River and extends into Oregon. Another large forest lies south of San Francisco, in Santa Cruz County. The widest portion of the great or northern body of Redwood timber lies in Mendocino County, between Ukiah and the ocean. Here it is by air line twenty-five miles wide, a vast, unbroken forest with branches extending inward up the cañons. The peculiarity of the Redwood is its love of moisture, which means here fog. The fog banks rise from the Pacific and flow inland like a great level sea of vapor. The lower mountains next the coast are enveloped, and farther on it fills the cañons, leaving the high mountains to rise like islands out of it. Still further inland only the lower portions of the cañons are filled with fog. At times the sea of fog will rise so high that it engulfs nearly the whole section back to the high dividing range of mountains which is the watershed between the streams running directly into the ocean and those which flow into the Russian and Eel Rivers, which extend for a long distance parallel to the coast line. Then the fog goes pouring through the passes in actual rivers of vapor, which run down the cañons toward the interior. Strangely enough, it always returns as it goes.

Now, with this sea of fog in mind one can locate the Redwood belt most accurately. Near the coast on the lower mountains and everywhere, the densest forest is almost exclusively of Redwood. Farther inward sweeps the same dense forest on the lower mountains and in the cañons at the same height. Redwood forest it is still on all the mountains, but of smaller trees, and the greater the elevation the more largely it is mixed with Douglas Spruce (*Pseudotsuga taxifolia*) and the Tan Bark Oak (*Quercus densiflora*). Still farther inland near the watershed spoken of before, Redwood only grows in the cañons, and the mountains are either open grazing-land, covered with Oak and Fir, or with that dense, low growth known as Chemical (*Adenostoma fascicularis*). Over the watershed, down those cañons where the fog pours over, there still are groves of Redwood, well confined to the moist banks close to the courses of the streams; while up the broad cañons of Eel and Russian Rivers the fogs roll and nourish the life of the grandest of all of the Redwoods till they are held back by the heat of the interior.

The Redwood is not only a lover of moisture, but, to an extent hardly to be believed unless seen, a condenser and conservator of moisture. Their tops reach high into the sea of vapor, and a constant precipitation from them like rain takes place. Last summer I was on the coast during a foggy time, and I remember that while the roads were dry and dusty, in the clearings under the Redwoods the water had been precipitated till it stood in puddles and formed mud holes. This abundance of moisture causes the densest of undergrowth, which only continual fires make passable. Hazels, Huckleberries, various *Ceanothus*, Ferns of large size and in the greatest profusion, with large bushes of *Rhododendron* and numerous other plants, make the forest floor a perfect tangle in the moist portions. The list of herbaceous plants here is not large, but they are delicate and beautiful. The glossy leaves of *Vancoveria hexandra* form dense masses; an Orchid, *Goodyera Menziesii*, is common; and in the spring *Trillium ovatum* and the *Erythroniums* are plentiful and so is the lovely *Clintonia*.

Of small Ferns, only the beautiful *Adiantum pedatum*, the Maiden-hair, is common; but there are several species of *Aspidium* and the *Woodwardia*; and Brake is everywhere, making in the cleared forest a solid mass four or five feet high. I have seen acres of the Brake seven or eight feet high, where a man could only crawl through the tunnel-like paths. Every year or two forest-fires sweep through this forest-tangle, but it springs up again with renewed vigor. The Redwood, unless very young, is not injured by fire. Its thick bark protects it, and often trees will be seen which had every limb stripped by the fire putting out a mass of foliage from top to bottom. No name could be more appropriate than *Sempervirens*, for it possesses wonderful vitality. A tree cut throws up hundreds of strong sprouts, and a stump is only killed by repeated burning. Fallen trees will often grow along the whole length of the stems, and throw up sprouts from the upturned roots; and I have seen sprouts six or eight feet high from logs. The commonest care would ensure the perpetuity of these grandest of forests.

Ukiah, Cal.

Carl Purdy.

Vegetation in Central Pennsylvania.

THE unusual mildness of the past winter, coupled with the excessive rains of the summer, have had a marked effect on many of our fruit and ornamental shrubs and trees. The poverty of bloom and general backwardness are conspicuous on every hand. The prospect for fruit is not encouraging. Cherries promise better than any of the other stone fruits, but their blossoms are thin and scattered; and one looks in vain for a single tree—even a Morello—which presents the usual resemblance to a "ball of snow." The ground underneath our finest trees is thickly strewn with the large flower-buds, each of which when opened shows the tell-tale black spot in the centre, although the scales and outer parts have enlarged a little. Peaches present a sorry sight. The older trees have either succumbed entirely, or have lost a large part of their branches, while the young trees show vigorous buds only here and there, the others having so swollen during the mild weather of January that they fell an easy prey to the few cold days of early March. The Peach is no doubt our most unreliable tree. It grows vigorously for a few years, but is strongly inclined to overbear, and unless this is checked by thinning the young fruit—which ought never to be neglected, although it generally is—it succumbs a few years later. Plums are in much better condition, but the blossoms are practically wanting.

Pears show the effect of the winter most plainly, since their large flower buds are easily distinguished, and still remain (May 7th) upon the trees, though shriveled and dying. The large-budded and vigorous growing Asiatic varieties, Mikado, Sha Tea, etc., of our Pear-orchard, are especially marked. They set fruit buds abundantly, but I do not think a single one is now living. Not speaking of the quality of the fruit, these varieties have much to commend them in their rapid growth and beautiful leaves and flowers, but the large, easily coaxed out buds must make their fruiting quite uncertain. The Apples are not yet in bloom, but they have pushed rapidly within the past few days. A considerable proportion of the trees are without flowers, and notably of such reliable kinds as the Crabs, which seldom fail. But the general outlook at present is much better than for any of the other large fruits, and favorable weather and absence from insect attack may fully make up for the scanty bloom.

Of flowering shrubs, the Forsythias, which we have been at some pains to recommend and disseminate from our nursery, present a curious sight. Instead of the profuse bloom which makes it the most conspicuous of our spring shrubs, it has only here and there a single flower, all the others having been nipped in the bud. Akebia, our prettiest twiner, held its leaves last year much longer than usual, and until the time the flower-buds generally begin to swell, but for some weeks thereafter not a sign of life was visible. Now, the first week in May, when it should be full of flowers and the delicate, five-fingered leaves rapidly expanding, there is but a hint of life at wide-scattered intervals, and latent leaf-buds are only slowly waking to the work that is thrown upon them. Early in February its flower-buds were expanded so far that the flowers could be seen. A month later they were dead. A Jackman's Clematis, somewhat sheltered, had young growth an inch and a half long. Tartarian Honeysuckles were also very forward through January and February; but they do not seem to have expended all their stock of buds, and are but little delayed, though the Honeysuckle promises but little bloom.

Naturally, everything which carries flower-buds through the winter suffered, and the larger the buds, the more easily were they deluded by the false hopes of midwinter, and the more easily they fell a prey to the cold weather of March.

State College, Penn.

W. A. Buckhout.

New or Little Known Plants.

Buckleya distichophylla.

THE French Broad River, one of the most picturesque of the streams which have their source in the Alleghany Mountains, flows along the base of a high limestone cliff just before it passes from North Carolina into Tennessee. This is Paint Rock, on the right bank of the river, and a few miles below the Warm Springs of North Carolina, a well known and much frequented health resort. Paint Rock is divided by a small stream which cuts through it nearly at right angles with the French Broad, into which the smaller stream falls at this point, marking the boundary between the two states. On the steep rocky ledges which rise from the banks of the smaller stream, which, unless it is swollen by freshets, is hardly more than a shallow brook, grows one of the rarest plants in America—*Buckleya distichophylla*, of which the first figure which has appeared is published on page 237 of this issue.

It is an interesting feature of the flora of the southern part of eastern North America that it contains several plants extremely localized; several of them monotypic, like *Neviusia* and *Darbya*, others like *Shortia* and *Buckleya*, with east Asia representatives hardly to be distinguished from their American prototypes; and others like *Croton Alabamensis* and *Rhus cotinoides* (a true Old World type), representing widely distributed American genera, but themselves very local. Several other plants could be named were it necessary to show more conclusively the changes which time has brought about in the character of our flora, reducing the number of individuals of certain types once widely distributed, if the theory of gradual extermination of certain forms of plants is to be accepted, to a few hundred or a few thousand individuals. *Buckleya* is one of the rarest of all these plants. The only place where it is known to grow is on the steep rocky ledges of Paint Rock. Here is the last stronghold in America of a very peculiar type, which, as it still exists over a considerable area in Asia, once occupied, it is possible to conceive, a much larger space on the American continent than it does at present. But there are special reasons why this particular plant cannot spread far or very fast from any spot where it had obtained a foothold. The male and female flowers are produced on different individuals, so that fertilization might not be accomplished always easily; and the seed, which ripens and falls in September, when the ground is usually dry and unfit to secure germination, loses its vitality almost immediately by the degeneration of the oily albumen which surrounds the embryo. The branches will not root like those of many plants when they come in contact with the soil, and it does not spread by underground shoots or stolons. The propagation of *Buckleya*, therefore, is dependent on the seed finding conditions favorable to its immediate germination; and that it does so still sometimes, is shown by the fact that a few seedlings and young plants are scattered among the older individuals; but there are not a great many of these, and one fire of very moderate severity would exterminate *Buckleya distichophylla* from its native locality as completely as *Gordonia Allamaha*, another very local southern plant, has been exterminated from the only spot it is known to have inhabited naturally.

Buckleya distichophylla has been known to botanists for many years. It was discovered by Mr. Thomas Nuttall, who, returning from one of his western journeys, ascended the French Broad in the autumn of 1816, and found this plant, which he referred to the genus *Borya*. Twenty or thirty years later Paint Rock was visited by Mr. S. B. Buckley, who made many botanical explorations in the south-

ern states, and finally settled in Texas, where he died a few years ago. Dr. Torrey, to whom Buckley sent specimens, determined the true character and relationship of the plant and bestowed upon it the name it bears. Asa Gray appears to have been the next botanist to visit Paint Rock. In 1842, soon after the charge of the Cambridge Botanic Garden was entrusted to him, Dr. Gray made a long journey through the mountain region of the south for the purpose of collecting roots and seeds for the garden. His visit to Paint Rock is interesting because he brought away with him a root of *Buckleya*, which he planted at Cambridge, where it still flourishes, and which, up to two years ago, was the only individual of this plant in cultivation. For years every effort was made to propagate the Cambridge plant; it bore pistillate flowers only, and so produced no seeds; neither green nor hard wood cuttings would strike; root cuttings failed to grow; layers were unsuccessfully tried year after year; no stock could be found on which it could be grafted successfully, and the experiment of grafting pieces of the roots with the branches, the last resource generally of baffled propagators, was equally unsuccessful. So for nearly forty years the Cambridge plant remained the absolutely unique representative of this genus in cultivation, an instance of rarity of a garden plant without a parallel so far as I can remember, when the period during which it lasted is considered.

A number of botanists have visited Paint Rock of late years, but none of them were there at just the right season to secure young plants or ripe seeds of *Buckleya*; but in the autumn of 1888 Mr. Canby and I went across the Big Smoky Mountains of Tennessee, and then made a detour to the French Broad for the purpose of looking up *Buckleya*. Fortunately, we got to Paint Rock just as the ripe fruit, of which there was a great crop, was falling, and we were able to secure several hundred seeds, which were sent home at once, packed in damp soil, and also a number of small seedlings. The seed arrived at the Arboretum in good order and germinated at once. Several of the young plants which we dug up have survived, so that there is now reason to hope that the existence of *Buckleya* in America may not be dependent on the rather remote chance that the surface of the ledges of Paint Rock may escape a visit of fire, and that the single old plant in Cambridge may last indefinitely.

Mr. Faxon's drawing shows so clearly the structure of the flowers and fruit of *Buckleya*, which are described in standard works of botany, that nothing more need be said about them now. The plant grows to a height of ten or twelve feet, with slender, graceful, spreading branches, and light green, delicate foliage, which is its chief beauty, the flowers and green fruit being quite inconspicuous. It is a member of the small although widely distributed family of the *Santalaceæ*; and its North American relatives are two shrubs of the southern states, *Pyrularia*, the Oilnut, and *Darbya*; and a familiar and common herb of northern woods, *Commandra umbellata*.

C. S. S.

Foreign Correspondence.

London Letter.

DECORATIVE PALMS.—The number of Palms now grown by nurserymen in England is surprising. They are represented by hundreds of thousands in some of the principal London establishments, and they are said to find a market readily enough to satisfy the growers. The seeds are imported by the bushel and sown, not in pans or boxes, but on beds in low houses where they require little attention and may be forked up and planted with ease. The species most abundantly grown are *Kentia Belmoreana*, *K. Fosteriana* and *K. Canterburyana*, *Areca lutescens*, *Seaforthia elegans*, *Ptychosperma Alexandra*, *Hyophorbe Verschaffeltii*, *Latania Borbonica* (*Livistona Sinensis*), *Cocos Weddelliana* and *Geonoma gracilis*. These names are those used by the nurserymen and I therefore use them in preference to those favored by botanists. An instance of the difficulties often presented by synonymy in plant names recently came under my notice. A nurseryman who grows *Latania Borbonica* by the thousand sent to Kew

for a plant of *Livistona Sinensis*, which, he said, was unknown to him. These Palms are the easiest of plants to accommodate when young; they may be grown huddled up together in a manner that would be fatal to most plants, and they grow into nice little plants in three years. They can be watered with the hose or large rose watering can, and they may safely be left to the care of a boy or garden laborer. I am informed that many of these English-grown Palms find buyers in America.

Whilst on the subject of Palms I may refer to the very interesting and instructive paper on "Exotic Palms in Florida," by Mr. T. L. Mead (see GARDEN AND FOREST, p. 175). If any one wishes to know how much or how little a knowledge of geographical botany may be expected to assist the cultivator in regard to questions of temperature he cannot do better than study Mr. Mead's report on the effects of from nine to eleven degrees of frost on the plants he enumerates. *Areca sapida*, a native of New Zealand, lost every leaf, whilst *Elæis Guiniensis* and *Raphia vinifera*, both from the equatorial

and which is in the collection of Baron Schroeder. It resembles the type in every character except color. The sepals and petals are flushed with lilac, and the reflexed portion of the labellum is colored dull bluish purple. It is more curious than beautiful. The plant appeared in the collection of Monsieur Vinck some three years ago, and it has shown the same peculiar color in its flowers every year since.

DENDROBIUM MACCARTHIE.—This magnificent plant is now flowering freely at Kew. It is one of the least common in gardens from the fact of its being bad to cultivate. It is found only in Ceylon, where it is much less plentiful now than it was a few years ago, owing, probably, to the visitations of the Orchid-collector. The Kew plants have this year made pseudo-bulbs over a yard long, and they bear near the top pendulous, three-flowered racemes, each flower being four inches across when fully expanded; the color is pale rosy mauve, with a large blotch of maroon-purple on the lower part of the lip, and streaks of the same color on the front portion. The Kew plants are grown in a very hot, moist stove,



Fig. 37.—*Buckleya distichophylla*.—See page 236.

1. Flowering branch of the staminate plant, natural size. 2. Flowering branch of the pistillate plant, natural size. 3. Fruiting branch, natural size.
4. Staminate flower, enlarged. 5. Vertical section of a staminate flower, enlarged. 6. Pistillate flower, enlarged. 7. Vertical section of a pistillate flower, enlarged.
8. Vertical section of a seed, somewhat enlarged. 9. Embryo, much magnified.

swamp regions of Africa, were in the one case partly cut back, in the other untouched. Two Palms from the hot, moist climate of the Sechelles—*Latania Commersoni* and *L. Lodigesii*, and *Phoenix paludosa* from the hot swamps of Bengal, were "all unhurt." *Hyophorbe Verschaffeltii* and a *Dypsis*, both from Mauritius, also escaped serious injury. These Palms are found wild only in the hottest of tropical countries, where frost would be unknown to them, yet they suffer less from frost than many plants, such as the Chilian Guava, the Cape Tecoma, Peaches, Oranges and even Roses, which when wild annually experience at least a little of it.

What are the structural or protoplasmic differences in these plants which account for this extraordinary behavior when exposed to cold? Records such as that by Mr. Mead are of the very greatest value to cultivators. We are only just beginning to get away from the notion that all plants from tropical countries must be grown in a hot-house.

BLUE-FLOWERED CATTLEYA.—The nearest approach to a blue *Cattleya* is a variety of *C. Lawrenceana* called *Vinckii*,

where they are kept saturated at all times save when the leaves are falling. It grows all through the winter, the flowers pushing immediately after the leaves have fallen.

DISA RACEMOSA.—This new and beautiful cool-house Orchid is again flowering freely at Kew. It grows and increases by means of stolons rapidly. The leaves are tufted, as in *D. grandiflora*, and the scapes are from a foot to eighteen inches high, with large, rosy red flowers. I described this plant last year, and refer to it again now so that Orchid-growers may not overlook it. In my opinion it is almost, if not quite, as good a garden plant as *D. grandiflora*.

ECHIU CALLITHYRSUM.—A tree-like example of this gigantic Bugloss is now the most attractive plant in the Winter Garden at Kew. It is twelve feet high and as much through, and almost every one of the hundred or so branches is terminated by an erect spike or thyrus of deep blue flowers, the flower-bearing portion of the strongest spike measuring a foot in length and as much in circumference. This specimen

has been gay with flowers for about three weeks, and it is still a magnificent picture. Of the many species of *Echium* found in the Canary Islands, this is much the handsomest and most satisfactory as a garden plant in England. Three years ago seeds of over thirty species of *Echium* were obtained for Kew from Teneriffe, but the plants raised from them were not worth the room they required. *E. callithyrsum* is sometimes called *E. arboreum*. It requires liberal treatment, a position where it will get plenty of sunshine, and it should be planted out, not grown in a pot. I should say that in the warmer parts of your country this species would grow and flower well in the open air.

STATICE.—Many of the species of this genus are found in the same region as the *Echiums* above mentioned, and they are exceedingly ornamental in flower when well grown. Seeds are easily procured from Teneriffe or Madeira, and plants may be grown from them in two years quite as large as large cabbages, and bearing long, branching scapes of rich blue or blue and red flowers. A few of the smaller species, such as *S. latifolia*, *S. macrophylla*, *S. profusa* and *S. Butcheri*, are grown as greenhouse plants in England. The flowers remain fresh on the plants many weeks; indeed, they are practically everlasting.

London.

W. Watson.

Cultural Department.

Some Notes on Echinocactus.

THE genus *Echinocactus* is represented in southern California by a great diversity of forms which nearly approach each other. The *Cactaceæ* are generally recognized as very difficult to study, not, perhaps, because they are characterless, but because of the difficulty of making specimens and the usual lack of material for study. Only by very extended and close field observation can one arrive at correct conclusions relative to species and varieties, and this none of our botanists have yet enjoyed.

Near San Diego the genus is represented by *E. viridescens*, Nutt., usually a low, depressed plant of about thirteen ribs, with pale straw-colored flowers and a slightly acid, pleasant fruit. This is a maritime species or variety almost wholly restricted to the immediate neighborhood of San Diego.

Echinocactus Orcuttii, Engelm., is found a little further to the south and further inland from the coast. It differs in size, the number of ribs (usually twenty-two to thirty), and in the young plants, which are globose. It is inclined to grow in cæspitose clumps of fifteen to twenty cylindrical heads, around which the ribs are often spirally inclined. It seems to form almost a connecting link between *E. viridescens* and *E. cylindraceus*, Engelm., which was originally collected by Dr. Parry on the eastern slopes of the mountains bordering the Colorado Desert, in San Diego County. Dr. Engelmann was at one time inclined to doubt its right to specific rank, as other botanists are still inclined to doubt. In 1882 I found what I determined was this species in the desert cañons of Lower California and also west of the mountains near the San Rafael Valley, and Dr. Engelmann wrote that he concurred with me in that opinion. This Cactus was a fine cylindrical plant, encompassed by a fine network of its slender, recurving white spines, with lemon-yellow flowers.

Echinocactus Lecontei, Engelm., is another species originally credited to the eastern slope of our mountains and to Arizona. Hundreds of plants annually reach the European market under this name, collected within the confines of the Colorado Desert, which differ in only a slight degree from *E. cylindraceus*. This form is more inclined to a grayish color, less flexible spines, and perhaps to a more globose shape. The demand in Europe for this particular species makes it command a higher price than many others, and it was only recently that I learned whence the trade was supplied. As they are collected near the original locality cited for it, no blame can attach to those who endeavor to supply the demand, but I must consider it merely a "trade name" for a form differing in no essential character from other plants yearly sent out under this, the preceding and the following names:

Echinocactus Wislizeni, Engelm., is the oldest name applied to any of these forms of Cacti. Some of the plants received under this name are beautiful, with white spines like those of *E. cylindraceus*; others have exceedingly handsome red spines; still others have dull spines of no special color. In young plants especially the color is very variable, as are also the spines.

Echinocactus Emoryi is the last of our Californian species to receive notice. It more nearly approaches the two first men-

tioned species, the reddish spines and flowers being usually the most characteristic features. But along with the red-spined and red-flowered plants I have found other varieties—white, green, brown and other shades—until no constant character can be found by which to distinguish between them.

English cacticulturists claim that *E. Orcuttii* is identical with the old *E. Californicus*, a name considered synonymous with *E. viridescens* by Dr. Engelmann. A great variety of plants have reached the European market under the latter name, which, considering its natural variations, is not to be wondered at.

I have carefully studied every form in southern and northern Lower California that I have been able to learn of, and I have been forced to the conclusion that only three true species exist within our limits: *E. polycephalus* (belonging to a distinct section of the genus), *E. Wislizeni* and *E. viridescens*. Under *E. Wislizeni* I would class as varieties *E. cylindraceus* and *E. Lecontei*; while under *E. viridescens* I would place *E. Emoryi* and *E. Orcuttii* as sufficiently well-marked varieties. Several other varieties of both these species could be sufficiently distinguished to satisfy the foreign trade. Perhaps these views will not be retained when I become more familiar with Arizona, New Mexico and Mexican forms, but they are certainly in line with the later views of Dr. Engelmann, the greatest authority on the family that we have had. C. R. Orcutt.

San Diego, Cal.

Chrysanthemums in Pots.—II.

PINCHING, or stopping, should be done just as it may appear necessary to get the plants bushy and even in shape. The outline of the future plant should be determined as early as July by five or six stakes, adding others as material for training develops. The leaving, or clearing away of suckers, should be regulated in the same way as pinching, and altogether in accordance with the habit of the plant. Early flowering and naturally bushy varieties, such as Hivü Fleuri, Chevalier Damage, Sachem, President Hyde, Souvenir de Mercède, Monsieur Freeman, L. Canning, and pompones generally, require but little pinching, and are, also, better for having the suckers removed. Enchantress, Neesima, Prince Alfred, Fair Maid of Guernsey, Kioto, Belle Paule, M. Delaux, Robert Bottomley and Mr. H. Cannell seem to need some suckers left if shapely specimens are desired. From careful observation I am satisfied that, for specimen plants, suckers produce just as fine flowers as the main stems. For specimen flowers it is absolutely necessary to have all suckers cleared away, and to develop, if possible, the crown-bud at the second break rather than to rely upon those which come away from its base, which are the shoots to produce flowers on a specimen plant.

As soon as the roots are well developed, so that they interlace around the sides of the pots, which should be some time in July, I commence giving liquid manure. I have a hundred-gallon cask partly sunken, which is kept about full of water, and from which I use all the time. At first once in two weeks, and later once a week, I pulverize about two bushels of cow-manure, which is allowed to settle, and the clear top-water used. Just before using I settle every day the ferment which has risen to the surface with a stream of water, and in about a week there is very little trace of solid manure left. For a change, a pail of wood-ashes, a lump of lime or two or three pounds of guano may be added to the mixture. After housing, I gradually diminish the strength of the application until the plants are in bloom, when clear water only is used.

Disbudding should be begun as soon as the superfluous buds can be handled. It is important to concentrate at once all the flower-producing energies of the plants on just the flowers needed to fill out the specimen; but if the "chinch" bug gets at work the best laid plans will avail nothing. I have never heard of an effective remedy against this destructive insect. Disbudding is a work which requires care and skill. If the plants are well filled out—as in the case of such reliable varieties as Golden Band, Minnie Miller, Puritan, Empress of Japan, Hivü Fleuri, Chevalier Damage, Norum Bega, L. Canning, Moonlight and President Hyde—all but the terminal bud may be removed. With some others—such as Robert Bottomley, Mr. H. Cannell, M. Delaux, occasionally, and Fair Maid of Guernsey—for the sake of filling out the specimen, the terminal bud has to be removed, and two or three buds below it allowed to develop.

I prefer to house the plant at the first danger of frost rather than run any risk from chills. A light, airy greenhouse is better than a pit, although I have had some plants do well enough in a pit where they were set up on pots so as to come



The Greendale Oak.—See page 233.

as near the glass as possible. I take the sashes off whenever the weather permits. For mildew I know of no remedy except sulphur, and I use black sulphur for look's sake. To air evenly is the best way to guard against mildew.

If the hose is applied at every favorable opportunity there is little danger of the different kinds of Aphis getting a foothold; except, possibly, the black variety. Dalmatian powder or Tobacco-dust is generally a sufficient remedy. After housing a small, reddish brown, hairless caterpillar (or what seemed to me to resemble a small cut-worm) eat the centres of the flowers. Being scarcely thicker than an ordi-

nary knitting needle and only one-third of an inch long, it was some time before I found these pests secreted amongst a few curled up dead leaves at the base of the plants. The stock plants were stored away until time for taking cuttings, which were placed in an ordinary cutting-bed, when some of the same enemies began to work on them, and gave me enough to do to keep them down. Their numbers increased rapidly, and spread on many other plants. Professor Smith, of the New Jersey Agricultural College, informs me that the pest is the larvæ of some nocturnal moth.

Wellesley, Mass.

T. D. H.

Roses under Glass.

THE in-door Rose season being now practically over, a few brief notes on the successes and disappointments of the past winter may be of interest. From a Rose-grower's point of view the winter was a trying one, although the temperature was not low; nevertheless, long-continued dull weather and an atmosphere saturated with moisture made careful watching necessary. Some growers attained success, but many others were unable to prevent the gradual depreciation of their stock and were forced to admit that the problem was too deep for them. The disease known among growers as "yellows" was a frequent cause of failure, and, as usual, various opinions were expressed as to its cause and prevention; but it still appears the most reasonable view that the disease is caused by an excess of moisture, either at the root or in the atmosphere, and it is aggravated by too high a temperature at night. It is only fair to state, however, that this opinion is not universally held.

The maintenance of a regular and proper temperature in the Rose-houses has been a matter of considerable difficulty, because the changes of weather have been so frequent that, without the presence of a reliable night-watchman, it was almost impossible to predict the condition of a house over night. This extremely variable weather has, perhaps, been less trying in those establishments where the heating is done by steam, as it is, doubtless, much easier to increase or to reduce the temperature of a house thus heated (provided the house is properly piped) than in one heated by hot water. It may be added, however, that all the good Roses sent to market during the season were not grown by steam heat.

Fashions in roses are changeable. Red roses, for example, were in great demand for several seasons preceding the last, and this was true in New York during the last season; while in Philadelphia red roses were seldom called for, and even so uniformly popular a flower as General Jacqueminot was not sought for with much eagerness. Some good flowers of W. F. Bennett were occasionally seen, but this rose, like American Beauty, does not give entire satisfaction, and appears to require some peculiarities in soil and treatment that are not generally understood.

The Duchess of Albany when first offered took the popular fancy, and found a ready sale, though it is claimed that this rose does not retain the brightness of its coloring after being cut for a time, and if this be proved true it is very doubtful if it will be able to usurp the place of La France. But as the Duchess of Albany has proved a profitable flower during the past winter, it undoubtedly will be largely planted next season, and a thorough comparative test will be given to it. Madame Hoste is established in popular favor, and seems destined to become a standard sort for forcing. Its large buds are of beautiful form, though not very distinct in color, and while it does not make an extra strong growth, it is free flowering, and appears to have a good constitution.

Souvenir of Wootton has created some disappointment, due in a measure to the fact that it was over-rated at the outset, and therefore aroused too high expectations. It is a good grower and a continuous bloomer, and the color is bright and pleasing. It is claimed that some flowers of this variety were produced as large as those of American Beauty, but it was not my good fortune to see them.

Ernest Metz is a Tea Rose, much commended by some growers, and it produces large and handsome pink flowers of good form. It has not been grown largely as yet, but as there are already so many good pink Tea Roses for winter flowering, a new-comer must develop many good qualities to secure a place on the list.

Among Hybrid Perpetuals for forcing there have been few innovations. For early work Anna Alexieff, Anna de Diesbach, Magna Charta and Mrs. John Laing are most prominent. Ulrich Brunner has proved its qualities of color and form, but whether it is sufficiently free-blooming for commercial work remains to be seen.

Captain Christy, when well-grown, is a magnificent rose, but it is seldom seen in quantity, being considered rather shy in blooming. Baroness Rothschild, Merveille de Lyons and Madame Gabriel Luizet especially have all been seen in good condition. Mdle. Marie Cointet has been tested as a forcing Rose, but did not prove a success, the flowers failing to open properly. Emperor of Morocco, an old Rose, has been forced on a small scale this winter, but while it is a handsome flower it is too dark in color to become very popular, as there is but little demand for very dark roses at any time.

Holmesburg, Pa.

W. H. Taplin.

Notes on American Plants.

THE Calendine Poppy (*Stylophorum diphyllum*) is now in full bloom. Its dense masses of foliage are of a light green shade, a foot or more high, among which the numerous bright yellow flowers, often two inches wide, are displayed in fine contrast. It is a plant one would notice from a distance, and especially at this season, for its abundance of foliage. A fine and rich soil in open sunlight is what it likes.

Cardamine rhomboidea, var. *purpurea* (Spring Cress), is a charming little plant, about six inches high, which flowers about the same time as the Spring Beauties, and somewhat resembles them in the color of its flowers. They are borne in a cyme and are rose-purple, lasting a week or more. Its natural home is said to be in rich soil along streams from western New York and Pennsylvania to Wisconsin. It certainly deserves a place in every collection of American plants.

It is interesting to note the difference in the flowers of the white variety of the purple Trillium (*T. erectum*, var. *album*) from different localities. We get from Pennsylvania the true var. *Album*, with pure white flowers, as white as those of *T. grandiflorum*. Indeed, a casual observer would take them for the flowers of that plant. From Connecticut we get another form of this variety, which is intermediate between the pure white and the typical *T. erectum*. In the Connecticut form the petals are of a yellowish shade, with a sprinkling of purple. Both forms of the variety and the true purple type all flowering together make an interesting display of this species.

Heuchera Americana (common Alum-root), when stimulated by cultivation, is a valuable plant for its foliage. The root-leaves, which endure through the winter, are often over two inches wide, of a velvety appearance above, and somewhat variegated. This variegation is not so intense, of course, as in many greenhouse plants grown for this reason, but is sufficiently strong to make the leaf very beautiful, and at no season more conspicuous than in early spring, as soon as the snow disappears, precisely the time when they would be most appreciated. Later in June, when the long scape has developed its loose panicle of pretty greenish purple flowers, and at a time when it has its greatest number of rivals, it is even then an attractive plant, and its flowers are useful for cutting. Its natural home is in rocky woodlands, and it is, no doubt, a valuable plant for rockeries. Yet it can be grown in any light rich soil in shade or sun. It is, however, probable that a partly shaded situation suits it best.

Jeffersonia diphylla (Twin-leaf, also called Rheumatism-root) is now in flower. Its height is only six or eight inches, and the single white flower, about an inch wide, is of short life and endures about as long as that of a Tigridia. The leaves are on long stems from the root and are curiously separated into two parts. It is an interesting plant for collections. It needs a rich soil and prefers shade.

Southwick, Mass.

F. H. Horsford.

Hardy Plants for Cut Flowers.—IV.

THE flowers of herbaceous plants often need some additional foliage as a setting to display them to the best advantage. *Ferula communis* is a noble plant, both for the back row of the border and for cutting purposes; the leaves are beautifully divided, of a bright, shining green color, and when the plants get well established are twelve to eighteen inches wide, and are invaluable for arranging with cut flowers. *Gypsophila paniculata* is another plant that is also most useful. The individual flowers are small and inconspicuous, but they are produced on many-branched panicles, which gives them the appearance of fine mist, and when mingled with other flowers in a vase make a charming effect. The Gillenias are pretty native plants that blend well with flowers when cut. Their pretty white flowers are not large, but are borne on a much-branched stem and last a long time. There are two species, *G. trifoliata* and *G. stipulacea*, the one flowering just after the other has done, so that their flowers may be had for several weeks in summer. They should be grown by all who wish useful plants to cut from.

The herbaceous Pæonies are general favorites, the newer varieties many of them are very fragrant, the colors are beautifully blended and are very showy where large effects are needed. It has recently been stated that Pæonies take three years to flower after being moved, but this statement is misleading. Our plants, which include some eighty varieties, were all moved and divided last year in April, and most of them flowered in May and June. It is sometimes said to be best to move Pæonies in fall. This is also open to question, for when shifted at that time they are very liable to be lifted

by the action of frost and their buds injured, in which case they certainly would not flower. If planted in spring before growth commences they will flower just as well, if the operation is carefully performed without injuring the large, tuberous roots.

Pæonies are useful for their flowers and for the large leathery foliage which stands well when cut, but care must be taken not to rob the plants of too many leaves or it will weaken them considerably. *Valeriana officinalis* is an old-fashioned garden plant, with flowers more fragrant than showy. It is very desirable, and does best when divided and replanted early in spring, for with our old plants are liable to die out. *Thermopsis Caroliniana* is attracting some attention as a new plant; there is really nothing new about it, for it has been offered for sale for eight years or more. It is desirable among tall-growing plants for its spikes of yellow Lupine-like flowers. They last a considerable time in water after being cut. The plant is perfectly hardy, but does not like to be disturbed when once planted. *Thermopsis*, in common with all leguminous plants, should be left undisturbed, because the roots are few and far spreading. The Everlasting Peas, *Lathyrus latifolius* and the white variety, are also impatient of disturbance, owing to the size and length of their roots; but for cutting they are always useful, especially the white variety. These Peas may be planted near fences or screens, and, as they grow rapidly during the summer months, they make a pretty drapery for such places. *Lathyrus grandiflorus* is also desirable, owing to the size of the flowers, which are more than twice as large as those of *L. latifolius*, though there are always fewer of them on a stem. If the Californian *L. splendens* proves hardy in the east it will be an acquisition to gardens.

Passaic, N. J.

E. O. Orpet.

The Bulb Border.—Now that the Tulips are showing their gay colors, it seems a good time to note that while formal planting may be very well in the parks and on large estates where masses of vivid color are a mere item in the landscape, it does not seem to be quite in the best taste for small gardens, where everything is closely under the eye. One often sees in small gardens the Tulips ranged exactly like the picture in the dealers' catalogues, rising from bare earth in mathematical precision at exactly so many inches apart, and almost smiting one in the face by their glare. Fortunately it is only a brief display; blooming together, they disappear soon with unanimity, and are pulled out unripened, to take their chances in some out-of-the-way corner. A much more satisfactory way for the small grower would seem to be to study his surroundings and secure as long a season of bloom as possible; never any great glare, but a long succession of flowers, with an almost daily change in the appearance of the border, which while perhaps not so impressive to passers by, is more pleasing to one fond of his garden. One can secure numerous varieties of Tulips which bloom at various times during quite two months without going beyond the cheaper sorts which are offered at such a reasonable price every fall. Selections should be made of all the sections—earliest, late, by-blooms, bizarras, parrots, etc.—and it is a very good plan to mix them up so that there will be no tendency to produce effects while planting. If one fancies a mass of some one color, a lot of this may be selected to make a special clump, but the main lot should be planted irregularly, to bloom without formality. Such a bed at first will lack foliage, and it is not until the ground is fairly full of bulbs that there will be a sufficient foil of green to be fully satisfactory, so that it is well to cover the bare earth with some creeper. *Lysimachia nummularia* (Moneywort) with me is very satisfactory for such a purpose, though the commonest of garden plants, being hardy, a free grower and having pleasing foliage; while the foliage of the bulbs is ripening the *Lysimachia* is a mass of bright yellow bloom, giving color to the border, after which the creeping stems being cut out and decaying foliage removed, the border may be planted over with Tuberous Begonias or some other suitable plants. Such a bed need not be occupied solely with Tulips; clumps of Narcissi make pleasing additions—in the front breadth may be grown such early flowering bulbs as Snowdrop, Crocus, Squills, Winter Aconite, Dwarf Irises, etc.—and it is well to reserve a space as a back border where some tall growing herbaceous plants may be flowered. Canterbury Bells are attractive in such a position. If a fence borders the bed a background may be made of some good climber. For a low fence I know of nothing neater than *Vitis heterophylla*, a beautiful foliaged vine, whose sprays are very useful for cutting.

Androsace sarmentosa is now showing its rosettes of rosy pink flowers, and is a very attractive dwarf plant for the front

border or rockery, where it should have good drainage and protection from excessive moisture. It is a Himalayan plant. *A. coronopifolia* is a neat little Russian biennial which has formed a colony on the border from self-sown seeds. It forms small neat rosettes of narrow foliage, and small, white flowers are produced on short scapes. A colony of this in bloom is graceful and pleasing, and well worth growing in the spring garden. It is perfectly hardy, and much better left without protection than grown in a frame, where it is likely to become drawn.

Ranunculus fumariæfolius is a neat, Fumitory-leaved Buttercup, and its plentiful yellow double flowers, about an inch in diameter, on single-flowered scapes, are now very attractive. Golden-yellow flowers are especially welcome in the border in the early spring.

Gold-laced Polyantheses have made such rich masses of color that, although a short time since I gave the preference to Hybrid Primulas, I am tempted to say that these many flowered Primulas should have a place in every garden also. Besides being rich in color, they have the advantage of long peduncles, and thus are useful for cutting. It is rather odd that the commercial florists who furnish the salesroom and stands with so many plants in the spring do not add good strains of Primulas to their list. They are universally appreciated and probably would find a ready sale.

Aquilegia flabellata is the first Columbine to show flower this season. This is a comparatively new Japanese variety, with broad wedge or fan-like foliage. It is robust and dwarf, the flower scapes, which are radical, being about a foot high. The flowers are fair-sized, with short, hooked spurs, and in color a creamy, slightly greenish white—no trace of other color appears on my flowers, though they are sometimes said to be flushed with violet. The scapes are furnished with from three to four flowers, which are of good substance, but are not as graceful in appearance as good forms of the American Columbines. This species is said to be allied to *A. Sibirica*.

Myosotis alpestris Victoria is a very dwarf, compact Forget-me-not, which in my garden is reliably hardy without protection and excellent for borders. Like the rest of the family, it may readily be had from seed and is increased rapidly by division. Any taste may be satisfied among the numerous varieties of *Myosotis*, *M. dissitiflora* probably being the most popular species now grown.

G.
Elizabeth, N. J.

Gathering Asparagus.—In an address before the Michigan Horticultural Society Mr. Charles W. Garfield objects to the use of the knife in the Asparagus-bed, and favors the breaking off of the stems as far below the surface of the ground as they will snap easily. The same advice has been given in these columns more than once. The white underground portion of the stalk is woody and useless, and the knife, unless it is in very careful hands, is likely to injure other buds. It is also good practice to cut every shoot in the bed, large and small. Some gardeners leave the slender shoots, under the impression that the roots will thus be strengthened and bear thick stalks next year. But for some reason this result does not follow. Perhaps some roots invariably bear small shoots, and if so, they should not be favored at the expense of better plants. When all the shoots are cut the strong roots with large stalks have an even chance and overshadow and crowd out the weaker ones.

S.
Bergen, N. J.

Recent Publications.

Forestry in North America.—II.

Part I. of the volume before us treats of the utility of forests, which the author shows to be twofold. In the first instance, forests are useful indirectly, in influencing the climate, in the distribution of rain-water, in the preservation of the soil on sloping ground, in the binding of moving sands and in affording shelter against winds. All these matters are exhaustively treated. In regard to the climatic influence of forests, the author gives an accurate and most useful summary of the researches which have been made to determine the effect of forest-growth upon the temperature of air and soil, rainfall, humidity and evaporation in Germany, Switzerland and France, mainly by the establishment of parallel stations, one being situated inside a fully stocked wood, and the other at some distance in the adjoining open country.

To illustrate the effect of forest-growth in protecting loose soil on hill-sides, the author mentions the Siwalik Hills, in

India, at the foot of the north-west Himalaya. We quote his words:

"Any one who has ever stood on the hills behind Hushiar-pur, in the Punjab, and looked down upon the plain stretched out toward the south-west, has carried away an impression which he is not likely to forget. In that part the Siwalik range consists of an exceedingly friable rock, looking almost like sand baked together. Formerly, the range was covered with a growth of forest-vegetation, but a number of years ago cattle owners settled in it, and under the combined attacks of man, cows, sheep and goats, the natural growth disappeared, while the tread of the beasts tended to loosen the soil. The annual monsoon rains, though not heavy, soon commenced a process of erosion and of carrying away the surface soil. Gradually, small and then large ravines and torrents were formed, which have torn the hill range into the most fantastic shapes, while the debris has been carried into the plains, forming, commencing at the places where the torrents emerge into the plain, fan-shaped accumulations of sand which reach for miles into the plain and which have already covered and rendered sterile extensive areas of formerly fertile fields. Indeed, one of these currents or drifts of sand has actually carried away a portion of the town of Hushiarpur. The evil has by no means reached its maximum extent, and if curative measures are not adopted at an early date, the progress of transporting the hill range into the plain will go on, until the greater part of the fertile plain stretching away from its foot has been rendered sterile."

The author might have added the denuded hills, and the rivers, formerly navigable, but now silted up in the Ratnagiri district of western India, and other similar instances, the counterpart of which is probably not wanting in the drier districts of North America.

Secondly, forests are useful, inasmuch as they furnish timber and other forest-produce. Under this head the author touches upon a question which will be more fully dealt with in a subsequent volume under the financial aspects of forest-management, namely, the relation of the income derived from a forest to the capital value of that forest. By way of illustration the author gives an account of the yield of a Scotch Pine-forest in England on soil of different quality and managed under different lengths of rotation. The capital value of such a property on the best quality of land, if managed on a rotation of 100 years, is stated to amount to £25 per acre for the land and £80 for the growing stock on it, total £105 per acre. Those compartments or portions of the forest on which the timber had attained the age of 100 years would contain 8,390 cubic feet of timber per acre. On the younger portions the growing stock would be less, and the estimated value (£80) is that of the timber standing on all compartments, old and young, calculated per acre all round. In the case of an estate of 1,000 acres the capital value of such a wood would be £105,000. If managed so as to furnish a regular annual yield, such an estate would produce (in the shape of final and intermediate cuttings) per acre per annum 129 cubic feet of timber, estimated to be worth forty-three shillings. Allowing two shillings per acre per annum all round for current expenses, the net income of the estate would amount to £2,050 a year, and this only corresponds to an interest on the capital value of the property of 1.95 per cent. In other words, if the proprietor sold the estate, the land with the timber standing on it, at the estimated rate, he would realize a sum of £105,000, which, if invested at four per cent. in government securities, or in other safe investments, would give him an annual income of £4,200, in the place of £2,050, which the management of the forest would yield. At first sight, therefore, forestry would seem to be a very bad business financially. But there is another side to the question. The proprietor, if he keeps his estate and manages it well, has a good chance of increasing its value. First of all, the soil of a well stocked forest improves steadily and hence the annual yield of such a forest goes on increasing. This steady improvement of land which has been kept continuously under well cared forest and the consequent increase of its timber yield is of great importance. The annual yield per acre of the state forests of the Kingdom of Württemberg (present area, 476,000 acres) has risen steadily, apart from fluctuations, from thirty-nine cubic feet per acre in the ten years 1823-32 to sixty-one cubic feet in the ten years from 1878 to 1887. Further, it is probable that in America the price of timber, and probably also in many cases the selling rate of the land, will rise very considerably. This chance of augmenting the capital value of his property and of increasing his income the proprietor loses when he sells the forest with the timber on it. On the other hand, it may be taken as certain that the interest of government securities will go down, and that it will

not in future be possible to invest large amounts safely at four per cent. Lastly, forest-property has this advantage, that if for any special purpose the proprietor requires money, he can obtain it by making extraordinary cuttings without trenching upon his capital and without necessarily diminishing the productive powers of his forest.

In places where small timber finds a ready sale, a shorter rotation, say of fifty years, may be adopted, which means that the timber is cut when about fifty years old. In that case the capital value of the estate would, in the particular instance selected, amount only to £51 an acre (land £25, growing stock £26) with a net annual income of 28-2=26 shillings an acre. In this case the growing stock of those compartments which had attained the age of fifty years would amount to 5,060 cubic feet of timber per acre. On 1,000 acres the capital value of an estate of 1,000 acres thus managed would be £51,000, and the net annual income £1,300, corresponding to interest at the rate of 2.55 per cent. These figures show that under certain circumstances it may be more profitable to work a forest on a shorter rotation. Thus the forests of Spruce and Scotch Pine in the district of Aix-la-Chapelle and other districts of Rhenish Prussia are worked on a rotation of fifty or sixty years, because the coal and other mines in those districts require large quantities of pit-props and other small timber, which gives a ready market for timber of the smaller sizes. And this holds good whether the forests belong to private proprietors, to towns or villages or to the state. On the other hand, the high forests of Oak and Beech in those districts are worked on a longer rotation, because of these kinds the large timber sells best. The state forests of the kingdom of Saxony are mostly worked on a rotation of eighty years, because they chiefly consist of Spruce, which timber in those parts commands a ready market at that age. These forests, which are managed on a very perfect system, comprise an aggregate area of 415,200 acres, and furnished in 1888 a net revenue of £392,270. The capital value of these estates (land and growing stock) is determined from time to time with great care, and it amounted in 1888 to £36 per acre, good and bad, and on this the net revenue of the year amounted to 2.62 per cent. There are, however, among the 110 forest-ranges of these state-forests a good many in which the net revenue of 1888 represented a higher percentage on the present capital value, in some instances more than four per cent.

It was right at the outset prominently to draw attention to these facts, because at first sight they seem to constitute an insuperable obstacle to the introduction of systematic forest-management in the United States. And yet it is probable that in North America the financial results of forestry will be in favor of systematic forest-management. Definite data are not available, and the following remarks are put forward merely by way of illustration. On a map in Professor Sargent's excellent report on the forests of North America, published in 1884, which represents a portion of California, and shows the distribution of the Redwood-forests, a considerable area is marked as containing standing Redwood averaging 200,000 feet (16,660 cubic feet) to the acre. These figures, it is presumed, relate to 1880, but it appears from data communicated by Dr. Mayr that at the time of his visit a few years ago the Redwood forests of California still contained some very heavily timbered lands. On page 267 of his book he gives a graphic description of some untouched woods 700 years old, the trees 275 feet high, and fifty-six stems to the acre, which contained, according to his measurements, the stupendous quantity of 188,000 cubic feet of timber per acre. Very likely, therefore, there are considerable areas of old Redwood-forest left containing much more than 16,660 cubic feet of timber per acre. Assuming, for the sake of argument, that this timber on the spot was worth twenty cents per cubic foot, the value of the standing crop would be \$3,330 per acre. Now, if a proprietor of, say, 1,000 acres of such forest were to clear the timber, without regard to the maintenance of the forest, and if he were to place the proceeds at four per cent., he would realize an annual income of \$133,000. If he were to manage the forest in a regular manner, with the view of maintaining it in a good state of productiveness, he might expect, judging from the analogy of forests in Europe, to realize a net income of two and a half per cent. on the value of the growing stock, and this would only be \$83,000 a year. As land in the case here selected would probably not be salable, its value has here been omitted. It is, however, a question whether the proprietor could at once dispose of \$3,330,000 worth of Redwood without lowering the price. If his estate contained 10,000 acres he would certainly have to be satisfied with considerably lower rates in order to complete the transaction at once. It is most probable that he would find it to his advantage to clear the

forest gradually, and in that case it would be far more advantageous at once to undertake a systematic treatment of the forest with the view of obtaining from it a steady annual yield of timber. Apart from the advantages of such a proceeding, which have already been indicated, others will suggest themselves to every practical man who has had experience in timber business on a large scale. It is more economical in the long run to make permanent arrangements for the carriage of timber by land and by water, to build roads, railways, open up streams for floating, than to make temporary arrangements which go to rack and ruin when the forest has been cleared. In a forest worked permanently upon a regular system it may be possible to settle colonies of laborers so as always to have a sufficiently large body of men trained to the work and experienced in it. And in any case the steady and systematic working of a large forest-estate will give the proprietor the benefit of the rise in timber prices which may with certainty be expected to occur in North America.

From Dr. Mayr's book, and from other sources, we know that some of the more important North American timber-trees have an extremely rapid growth. He describes a forest of the Douglas Fir in south Oregon, second growth, eighty years old, the trees 130 feet high, and 320 trees to the acre, which, according to his measurements, contained 58,000 cubic feet of timber. This means that in this forest during the eighty years of its life, on an average, 725 cubic feet were produced annually on one acre. The best Spruce-forests in Germany only accomplish about one-fifth part of this growth. Rapid growth means a large annual yield of timber and a large net income from the forest. It is not impossible that in many forest-districts of North America the financial results of systematic forest-management will be found to be far more favorable than they are in Germany. But in order to reap the benefit of these exceedingly favorable conditions the goose which lays the golden eggs must not be killed.

The remarks made up to this point chiefly relate to matters discussed by Dr. Schlich in the first or general part of his book. Another article will be devoted to the second part of the book, in which the principles of silviculture are set forth.

Bonn, Germany.

D. Brandis.

Correspondence.

The Decorative Use of Flowers.

To the Editor of GARDEN AND FOREST:

Sir.—The article by Mrs. Wheeler, in GARDEN AND FOREST for January 22d, was so full of suggestion that I venture to supplement it by a few additional thoughts on this fascinating branch of decorative art. It is evident that the use of flowers is increasing, and although some persons are inclined to condemn the extravagance which selects flowers on account of their costliness rather than in accordance with their genuine beauty, it is well to remember that a more harmless kind of luxury could not be chosen.

The true artist in flowers is as truly an educator as the painter, and the crowds which always gather about the best floral arrangements when exhibited testify to the interest they arouse. The designers are rare who meet with the highest success, even in simple attempts—which, by the way, are often the most satisfactory. The art which conceals itself under the guise of simplicity and the power to adapt natural grace and beauty to decorative use are rare gifts. One worker will arrange his Laurel branches so that the curving leaves and little branchlets will present all their native charm, while another will have them bunched and twisted until the beauty of color alone remains. An Ivy screen can have every leaf naturally placed so as to form a perfect background, or the leaves may be inverted and pointing in all directions so as to annoy a lover of beauty as discords do the lovers of music. A not uncommon fault in arrangements of Orchids is that the flowers are upside down.

Skill in choosing suitable materials and making the most of them comes with practice and observation only. All of us who have tried it know how perishable and hard to manage are the fronds of the Maiden-hair Ferns. One of the florists of this city first overcame the difficulty by starting his baskets of flowers with a pot of growing *Adiantum Farleyense* and filling other things about it. The Fern, on its own roots, long preserved its freshness and natural grace of growth and motion.

It is true that an appreciation of form depends upon a more cultivated intelligence than does that of color, and yet the latter is more dependent upon accessories than form is. Light and backgrounds are essential to color, yet we have all en-

joyed the waving forms of trees in a dim light, or their graceful branches and large leaves in churches or halls so dark as to appear gloomy. Nothing gives more spirit to a combination than the radiating forms of leaves.

It is often said that green gives freshness and white brilliancy, and both can be used freely. Another principle is that while all colors look well massed by themselves, the powerful ones should be sparingly employed in combination, while the delicate and light colored ones gain by proximity and massing. For instance, a quantity of scarlet *Salvia* or *Geranium*, in combination with other reds or purples, will, at the best, appear crude and glaring; but scatter the flowers and have fewer of them mingled with plenty of white and green, and they reveal all their brilliancy. Carnations mass well, and also appear beautiful when seen singly; but Roses, with few exceptions, should show their individuality.

Concerning backgrounds, it is well to note that while nearly all feel their influence few of us think where it comes from. Color is intensified or dulled, concealed or brought out, by their use and form. Dark flowers on light backgrounds, and light on dark, are of course effective, but for our purpose we can change either of them by light colored foliage or that which gives us deep shadows. White flowers can be made beautiful even against a background of their own color by mingling dark foliage with them. Dull reds often enhance the pinks and scarlets, and maroon will sometimes make a dull purple look clear, but these are difficult effects to obtain, and better ones are easily had.

Some of our best decorators owe their success to judgment in selecting floral materials suited to the scenes they are required to adorn, as well as to skill in arranging them. When we buy flowers we can in a measure get those that meet our artistic requirements, but the supply from our own places is often limited, and so on occasion it may be well to prepare the surroundings somewhat before arranging the flowers. The more unobtrusively this is done the happier the result. A vase of yellow Lilies can be helped by being placed upon a stand covered with a blue cloth or having a blue tile top, but a curtain hung behind it of unusual color in some familiar place is likely to be obtrusive. Unusual occasions, however, demand even extraordinary decorations.

Long-stemmed flowers in suitable receptacles are likely to remain the best means of general decoration for a long time to come. Plenty of water preserves their freshness, and the flowers are usually displayed in an effective and natural position. The flower-holders offer us a way for the artistic introduction of color often wanted for the completion of the scene. With the exception of those of clear glass, which allow the stems to be seen, earthen ware in plain colors seems the best. Silver is beautiful and brass often has the effect a frame does on a picture. A dark blue, which is a rare color among flowers, can be introduced in this manner, and is perhaps the most useful color. A deep orange is another color that combines well with many things. Both these are effective in a composition where foliage and growing plants alone are in use. White is usually too glaring and hurts flowers, but there is no color that cannot be effective in some situations. Black is sometimes invaluable. One of our best known florist's workers is fond of repeating the color of his jars in the mass of flowers he fills them with, at times using them of lighter and again of darker tones of color, both being effective.

If we do not attempt anything more elaborate than these examples and restrict ourselves to the use of a few colors, success is likely to be won, although elaborate compositions need not be against the laws of art or canons of taste. An effect that pleases when it can be attained is to repeat the same color in different kinds of flowers, in which case the hue must be exact unless we intend to have shaded effects. Another is to repeat different colors in the same kind of flowers. If we have pink Roses and white ones to arrange in two vases, it is better to have one all white and one all pink, if placed where both are seen at once, rather than mingle the colors so that both arrangements are alike.

Mountainville, N. Y.

John De Wolf.

Notes.

Achillea argentea really has the silvery leaves its name implies. It seems to be the earliest of the family to bloom, and its white flowers above the neat dwarf foliage are very pleasing.

Wallflowers which were left outside all winter are much more stocky, and came into bloom earlier than those in frames. This might not prove the case in more severe seasons.

Mr. Walker, the largest grower of Daffodils for market in England, states that the flowers should be cut while in bud and be opened in water and heat under glass. As a rule, the buds should be free of the spathe before they are cut, and the very best time for cutting is just as the perianth segments burst open.

The fifteenth annual meeting of the American Association of Nurserymen will be held at the Park Avenue Hotel, in this city, beginning on the 4th of June and continuing for three days. An unusually attractive programme of exercises has been arranged, and papers may be expected from many of the leading authorities in the country upon horticulture, pomology and forestry.

Some years ago seeds of Russian Rhubarb were sent to the State Experiment Station at Amherst, Massachusetts, and plants raised from them matured seed. A number of plants have been produced from this home-grown seed, and the roots, it is said, have been sent out for trial by druggists. It would be interesting to know whether any reports as to the medicinal value of the roots have been made.

The proceedings of the thirty-fifth annual meeting of the Western New York Horticultural Society make a compact pamphlet of nearly 200 pages, filled with valuable suggestions for fruit-growers especially. A very full report of the meeting was given in this journal; but the pamphlet just received once more calls attention to the unusual amount of instructive matter contained in the addresses and discussions.

Southern tomatoes have been greatly interfered with by the frost, and hot-house tomatoes are in good demand at fifty cents a pound. Honey peaches from Florida, the first of the season, are selling for seventy-five cents a dozen. California cherries have just come in; Black Tartarians bring \$1.50 a box. New limes bring from fifteen to twenty cents a dozen. Fresh tamarinds are exceedingly fine. Physicians allow invalids to take them after medicines with a disagreeable taste, and they are used largely for flavoring lemonade.

The first part of the twelfth volume of the "Journal of the Royal Horticultural Society" of England has reached us. Reports of the Vegetable Conference and of the Chrysanthemum Centenary Conference, held in London last year, occupy a large proportion of the pages of this part, and contain a large amount of valuable information. The Journal is now one of the most useful of serial horticultural publications, and cannot fail to increase the taste and knowledge of cultivated plants. It is an essential addition to the library of every horticulturist and of every working botanist occupied with the study of cultivated plants.

Professor C. C. Caldwell quotes from Dr. Mueller to the effect that the sugar of the Grape is produced in the leaves; that toward the end of summer the older leaves diminish in activity and only the younger ones make sugar; that leaves some distance beyond the fruit may produce sugar for it, as may also leaves on lateral shoots springing from the fruit-bearing branch, but only when those shoots are above the fruit or close to it. Pruning by cutting off the ends of fruit-bearing branches was found injurious, and by too close pruning fruit was produced having four or five per cent. less sugar than fruit on unpruned branches.

During the past week the flowering Dogwood, the Silver-bell (*Halesia*), the Bladder-nut (*Staphylea*), the Black Haw, the Sweet Viburnum and the Judas-tree, among our native shrubs and smaller trees, have come into bloom in Central Park. The Lilacs are in full flower, and so are the Kerrias, double and single, *Exochorda*, *Rhodotypus*, *Azalea amœna*, the Hawthorns, and many kinds of *Prunus*. The most interesting among herbaceous plants which have lately come into flower are *Phlox amœna* and *P. divaricata*, *Iris pumila* and its varieties, *Houstonia* and Bird's-foot Violets. The park was never better kept and never looked more beautiful.

Amelanchier oligocarpa, of which a figure and description were published on page 245 of the first volume of GARDEN AND FOREST, proves to be a garden plant of great beauty; and the size it attains in cultivation, the vigor of its growth and the abundance of its flowers are surprising to those persons who have only seen this shrub growing in its home in our far northern forests. Specimens in the Arnold Arboretum are now nearly three feet high and three or four feet across, forming perfectly symmetrical compact bushes, which this year have been covered as with a sheet with their handsome solitary white flowers, which, however, like those of the other species of *Amelanchier*, are of short duration. This is certainly one of the most desirable of our native plants to in-

troduce into the garden, and when it is better known and its beauty recognized, it is certain to become popular.

On Monday of this week the Flower Mission of this city began the work of its twentieth year by sending great numbers of Apple-blossoms, Lilacs, Pansies, Buttercups and other flowers to the various hospitals and to the sick in tenement-houses. Fifty ladies were present on the first distribution-day, and it is hoped that still more will offer their services in future. The service required is not simply the arranging of the flowers in bouquets, but the delivery of them to the sick, who appreciate the flowers more highly when they receive them directly from the hands of the distributors. Donations of fruit as well as of flowers are requested for this beautiful charity.

In *Agricultural Science* for April, Professor C. M. Weed, of the Ohio Experiment Station, has an interesting note on the use of arsenites for the Plum curculio. Many experiments have been reported in which alternate trees were treated and the sprayed trees yielded as little sound fruit as the others. Mr. Weed points out that the remedy acts mainly by destroying adult beetles that feed on the surface of the fruit and foliage. It need not act upon the beetles when engaged in oviposition nor upon the larvæ after hatching. The beetles from unsprayed trees may deposit eggs on the fruit of sprayed trees, and beetles killed on sprayed trees will lessen the injury on the check trees. A fair test cannot therefore be made with a few trees close together. An examination of the question convinces Professor Weed, however, that in good sized orchards of Cherries, Plums and Apples the arsenites furnish a complete and practical remedy for the curculio.

The apple scab is caused, as is well known, by a parasitic fungus (*Fusicladium dendriticum*). The injury to fruit is often very great, and in neglected orchards the entire crop may prove of no value except for cider. Some careful experiments made by Professor Taft, of the Michigan Agricultural College, showed that the size of apples affected by the scab was reduced by one-tenth on an average, making a loss in bulk, not to speak of the loss in good appearance, of fully a bushel to a tree. Of various remedies tested the most effective was a spray of the so-called "Eau Celeste," somewhat diluted. The mixture is prepared by dissolving two pounds of copper sulphate in hot water in one vessel, and two and a half pounds of carbonate of soda in another. The two solutions are mixed, a pint and a half of ammonia is added, and the whole is diluted to thirty-two gallons. An orchard can be sprayed at a cost of two cents a tree, and the treatment may make the difference between success and failure of the crop.

The unequal effects of the past winter on vegetation in different parts of the country is remarkable. A correspondent describes on another page the condition of the flower-buds of many early flowering-trees in Pennsylvania. In eastern Massachusetts, where the winter was also exceptionally mild and where the thermometer fell to zero once at least during the month of March, Cherry-trees are remarkably full of flowers. The buds of Peach-trees are generally uninjured; Plum-trees are blooming abundantly; there is a great show of flowers on Pear-trees; Apple-buds are uninjured. Forsythias have all flowered as freely as usual, although the flowers have been perhaps rather smaller in size than they were last year. The Chinese Magnolias have all flowered well, although the size of the flowers was reduced by a frost of several degrees which occurred just as the buds were opening. The different *Ame-lanchiers* have been unusually full of flowers. Flowers of the Chinese and Japanese Apples are just opening and have never been more abundant. This is true of Thunberg's Barberry, the earliest of the genus to flower, and of Thunberg's *Spiræa*, the ends of the shoots of which are not more injured than usual. The flowers of *Andromeda floribunda* have never been more abundant or larger or better colored. Those of *Andromeda japonica* were entirely killed during the winter. The Japanese *Prunus pendula* lost some of its buds, and the flowers which developed have been smaller than usual; while the flower-buds of the Sweet Almond were nearly all killed. On the other hand, the Flowering Dogwood never gave a better promise of flowers than it does this year, although in the latitude of Massachusetts the buds often suffer in severe winters. It is unusual to see Lilacs so covered with flower-buds as they are this season in Massachusetts. The flowers of the Red Maple were uninjured, and the fruit is already half grown, although the late frosts destroyed the flowers of the Silver Maples or most of them. The Norway Maples have flowered profusely, as usual. Rhododendrons and Ghent Azaleas have never before in Massachusetts given such a promise of flowers as they do this spring.

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The Management of our Experiment Stations.

THE Agricultural Experiment Stations recently established in the various states have been subjected to much flippant criticism by persons who have no adequate idea of their purposes and possible value. We recall one instance of a most instructive feeding experiment at one of these stations in which tests of certain food-rations were made to ascertain their comparative efficacy in the production of milk. The work in this case was in every way a suitable one for such an institution. The facts established could be at once put to practical use by dairymen, and could be made directly profitable in their business. The tests were such as dairymen could not make for themselves, because they required a technical knowledge and a habit of scientific accuracy in observation and measurement to which ordinary farmers do not pretend. Besides this the experiment required time and money which the farmer could not afford to expend and an equipment in the way of apparatus which he did not possess. Every one familiar with such subjects knows that investigations of this sort have done much to improve the dairy practice of the country and to secure a cheaper and better product. And yet the bulletin setting forth the results of the experiment spoken of was ridiculed in more than one of our great city dailies, the writers making themselves particularly merry over the fact that the cows treated were referred to, as is usual in such cases, by their names. Of course criticism like this is entirely empty, but it is annoying by its very silliness. It certainly is not pleasant for men engaged in serious, honest and useful work to find themselves mocked and jeered at and made the butt of vulgar jokes.

Quite as annoying, and almost as senseless, are the strictures of persons who expect too much of the stations. They complain because immediate answers are not given to questions which demand years of patient study. One man wonders why so much time is given to the investiga-

tion of the Sweet Potato disease, when he is anxious to know the exact effect of potash salts upon the sugar content of the grape. Another complains because all the new varieties of fruits and vegetables are not subjected to comparative tests, while a third objects to such experiments as worthless for other soils and climates than those of the station farm, and urges the officers to confine themselves to the investigation of principles which demand the oversight of men trained to scientific method, and leave minor details of practice like the testing of strawberries and tomatoes to individual growers, who are fully competent to decide such matters for themselves. Here we approach debatable ground, and the stations must be able to show not only that they are prosecuting their inquiries on the most approved methods, but that they have selected the proper subjects for investigation. They must be able, too, to state the principles which control this selection, and give the reason why their chosen field of study is made to include certain definite subjects, and why it excludes every other subject. Every competent station officer will welcome honest and kindly criticism which touches the vital principles upon which these organizations must stand or fall, and every such officer will admit that in matters of mere administration they should always be subject to closest scrutiny.

The stations can afford to overlook captious criticism, but they should be quick to profit by any warning or reproof from a friendly quarter, and the editorial article in the April number of *Agricultural Science* should, therefore, receive special consideration. The editor, who is Vice-Director of the Experiment Station of the Indiana Agricultural College, here charges or insinuates that, in many cases, the law which requires the quarterly issue of bulletins is not complied with; that in some states the appropriation for the station is expended in violation of the spirit and letter of the law; that, in certain cases, the money intended for the stations is largely expended upon the colleges; that the Director of one or more stations is a mere figure-head; that the work done in some stations is only scientific in name, while in reality it is a bungling farce. Now, we cannot identify the stations at which these comments are leveled, but we should be surprised if a Congressional investigation could not make out as strong a case against many of them. Even in the states where the most intelligent interest is taken in the stations it is very difficult to secure men properly trained to do the work required. There are not enough available men of this quality in the country; and in states where little attention has been given to the aid which can be rendered by science to horticulture and to agriculture, it is not improbable that the station-work has been entrusted to very incompetent hands. And, no doubt, it is true that in some cases, where a good director has been chosen, his choice of assistants has been hampered by the interference of local statesmen, who are too often eager to seize upon any position with a salary for some dependent politician. Upon the whole, the wonder is that so many of the stations are as good as they are.

And yet they must be a great deal better than they are if they are finally to escape the charge of misusing the liberal appropriation at their disposal. In the colleges and in the stations themselves a staff of young men should be under constant training, and the excuse that it is impossible to find men competent to do the work of the stations ought not to be a valid one much longer. There is an association made up of the officers of the agricultural colleges and of the stations, and it would seem to be worth while for this body to make a searching inquiry into the condition of the institutions it represents. The shortcomings of a few stations will discredit all. And it should be remembered, too, that the stations will not satisfy the reasonable demands of the people who are taxed for their support if they simply refrain from violating law and live up to the letter of their obligations. They must prove themselves positive and efficient forces in horticultural and agricultural progress. Unless they compel

respect they are failures. They will not be pronounced successful until their bulletins are accepted as standard and authoritative in the literature of applied science.

In the closing hours of the legislative session at Albany, an effort was made to smuggle through, in the form of an Amendment to another Act, a law authorizing the construction of a straight and level speed-road through Central Park. The measure was again defeated, for this was not the first attempt to pass it; but it will surely reappear before succeeding legislatures, among the various schemes to confiscate the grounds belonging to the people in the interest of a special class. This particular project, however, is a singularly offensive one. Even if the track could be constructed without interfering with the right of entrance to the park by those who would be compelled to cross it, its purpose is simply to afford pleasure to a few rich men for a short time in the spring and in the fall. To accomplish this, these men are asking the people to pay for the devastation of the scenery of the park, which is its fundamental value—scenery which it has cost millions of money and the watchful care of long years to provide. No other attack on the park contemplates the destruction of so large a portion of its area or the introduction of so many elements that are subversive of its design and purpose. These owners of fast horses have little need of the park, even if they have any feeling for its beauties, because they are able to enjoy the sunshine of the south in winter, and the cool breezes of the Berkshire Hills or of the seaside in summer. But the city is full of people who may have less money, but who have quite as much right to the use of the park and a more refined appreciation of its value. The park should be preserved for the people, and the whole people, and not ruined in the interest of horses and their drivers, however aristocratic may be the breeding of either.

The Cork Oak.

THE Cork Oak, of which a portrait taken in Algeria appears in our illustration on page 251, produces the most valuable bark of all trees, with perhaps the exception of the Cinchona, and the money value of the world's product of cork is greater than that of the quinine it consumes. It is a native of the Mediterranean basin in northern Africa, in Corsica, Sicily, southern France and the Iberian peninsula, across which it extends to the shores of the Atlantic in Portugal and of the Bay of Biscay. It is an evergreen species very much resembling some varieties of the Ilex or Evergreen Oak of southern Europe, with ovate-oblong blunt coriaceous leaves, which are sometimes entire and sometimes sharply serrate, and downy on the lower surface. It rarely attains a greater height than twenty-five or thirty feet and trunks more than two feet in diameter are exceptional. The value of the tree is in its bark. The outer layer becomes, through annual additions on the inner surface, after the tree has attained a certain age and size, a thick, soft, homogeneous mass possessing the compressible and elastic properties upon which its economic value depends. Cork is, in a certain sense, an artificial production, as the bark naturally developed by the trees is of comparatively little value. This last is called "Virgin Cork," and is stripped from the trees when they are from fifteen to twenty years old. It is rough and woody in texture and is only valuable as a tanning material or for the coarsest kinds of rustic work. The removal, however, of the natural bark causes the development of another growth of much finer and more compact quality. This is removed every eight or ten years, the quality of cork improving with each successive stripping, and the trees continuing to live and thrive under the operation for more than a hundred years. The bark is stripped during the months of July and August. Two cuts are made around the stem, the first above the ground and the second directly under the forking of the main branches. These cuts are then connected by three or four longitudinal incisions which thus divide the bark of the whole trunk into as many divisions. Only the outer coating can be removed without destroying the tree, and the greatest care is taken therefore not to injure the inner bark. The cork is removed with the aid of the wedge-shaped handle of the tool used in making the incisions. The outer surface of the bark, as soon as it is stripped from

the trees, is scraped and cleaned, and the pieces are then flattened, heated slightly and pressed under stones on a flat surface. The heating chars the surface and closes the pores, giving to the bark what is technically called "nerve." In this state it is ready for manufacture or exportation.

The amount of cork used in the world and the number of uses for it are increasing enormously. It was not until the end of the seventeenth century that bottles were stopped with corks, although it would seem that its value for this purpose was known to the Romans, as Horace ("Odes," III, 8) speaks of

"Corticem adstrictum pice dimovebit
Amphoræ."

The available forests of Cork-trees are already relatively extensive, although hardly sufficient to supply the demands now made on them, or which as the world grows in prosperity must be made on them, for there is hardly any end to the uses for cork, and none of the substitutes for it, which have yet been tried are very satisfactory or promise to take its place to any great extent. The latest estimates of existing areas of available Cork Oak forests make their extent from 3,300,000 to 3,500,000 acres, of which about one-half, including those on its African possessions, belongs to France.*

The wood of the Cork Oak is heavy, coarse-grained, and of a yellow-brown color; it shrinks and warps badly in seasoning and decays rapidly when exposed to the action of the atmosphere. It has little value in the arts but furnishes a useful fuel and makes good charcoal. The inner bark is rich in tannin and trees too old or unfit to produce cork are cut for the sake of the inner bark.

The Cork Oak is an interesting tree to Americans, as its cultivation now seems destined to become an important industry in California, where the climate and the soil in many parts of the state are admirably suited to produce it. This is not a mere theory, as trees have been growing now for several years in California and have already produced crops of cork of excellent quality. It is probable that the tree will grow rather more rapidly in California than it does in its native country, although the quality of the soil, the exposure in which the trees are placed, local climate and the treatment which the trees receive will influence, of course, the rapidity with which the bark is developed. In Africa it is found that the trees which grow the most rapidly produce bark of the poorest quality, and that within certain limits the slower the trees grow the more valuable the product, provided the growth is not too slow, in which case the bark loses some of the elasticity which makes it valuable. The conditions which influence the development of cork are so numerous and complicated that the product of all the trees in a grove or forest can never attain the same uniformity of thickness or quality in any given time. This is so well understood in the countries where cork is grown that the best method of harvesting has been found to be to go over the forest every two or three years and remove the bark from such trees as are covered with merchantable cork and not to strip all the trees at the same time. All these matters must of course be considered in connection with planting forests of the Cork Oak in California. The planting and care of such forests in Portugal and Spain has long been an important industry, and there is no reason why they may not be made so in California, where the local consumption of cork is already enormous, although the wine industry there is hardly more than in its infancy.

We are indebted to Mr. Francis Skinner, of Boston, for the photograph from which the illustration of the Algerian tree has been made.

The Cedar of Mount Atlas.

THE classical Cedar of antiquity has, it is well known, become exceedingly rare on Mount Lebanon, where it exists, outside of the famous grove of about 350 trees, in a few remote and rarely visited stations only. There is nothing more beautiful or more venerable than the little forest of Cedars standing out dark and green on the naked and forbidding background of the high Lebanon range. Each tree, with its original and expressive aspect, seems to relate a history full of memories. But this famous grove of Cedars leaves upon the visitor a sad impression, for no one who sees it can divest himself of the idea that the venerable trees are perishing. The nine old trees are mutilated and injured less by time and the severity of the climate than by the carelessness of shepherds and pilgrims, who break off the branches and often

* "Notice sur les forêts de la Tunisie," Exposition Universelle de 1889, Tunisie. Direction des Forêts.

build fires about the trees; and, what is still more serious, young plants are not growing up, as the goats destroy them as soon as they appear.

If the student of the Bible deplores the approaching loss of these, the most touching monuments of antiquity, the botanist and the forester may find at least this consolation, that the Cedar is found on other mountain ranges, so that a speedy extermination of the race is not probable. Vast forests of the true Cedar of Lebanon exist, at an elevation of from 4,000 to 6,000 feet, on the immense masses of mountains which extend all along the coast of Cilicia. It was Kotschy who discovered and described these great forests of Cedars (see his charming work entitled "A Journey to the Taurus of Cilicia," published in 1858). In reality, the station of the Cedar on Mount Lebanon is only the most southern outpost of the species, while the centre of its distribution and its real home is in Cilicia, where it is found in the greatest abundance, and where it reproduces itself vigorously. But to really comprehend the geographical distribution of this splendid tree one must look to the western and the driest part of the Himalaya Mountains, where is found that conifer known from the time of the most ancient Indian antiquity under the name of "Deodar" or "Wood of the Gods," the *Cedrus Deodara* of botanists. It is not surprising that this wonderful plant has been mistaken for a distinct species. It is a much larger tree, and its habit, although not unlike that of the Cedar of Lebanon, differs from it in its slender young shoots and in its larger and longer cones. In the opposite direction, another tree, very much like the Cedar of Lebanon, has been discovered in the Atlas Mountains of Algeria; but in the case of this tree all its parts are smaller than those of the tree of Mount Lebanon. The more the mountain chains, which extend from the frontier of Tunis in a double rank through northern Africa to the boundary of Morocco, are explored, the more widely distributed this beautiful tree is found to be. Manetti has given to the African Cedar the name of *Cedrus Atlantica*, but a critical study of these three trees has shown Sir Joseph Hooker that they are not really three species, but simply three varieties, or rather races, of the same species, as it is principally the dimensions of individuals, and not essential differences, which distinguish them.

The race of the Himalaya, in conformity with the immensity of that mountain system, where all vegetable forms assume an extraordinary size, is the largest. The race of the Taurus and of the Lebanon occupies an intermediate position, while that of Mount Atlas is the smallest, on account of the dryness of the severe climate of the region. The remarkable dimorphism, even, which appears among trees with dark green foliage, and others with silvery gray foliage mixed together in the same wood, is found in these three stations, in the Himalaya as in the Taurus and in the mountains of Blidah. This dimorphism is known to gardeners, as it is seen frequently in cultivated plants of the three varieties now widely distributed in the gardens of southern Europe.

I had the good fortune, in a recent journey, to penetrate to the region occupied by the African Cedar and to cross it at different points, and it seems to me that it might be interesting for the readers in the New World to learn a few details of a plant of the Old World which every reader of the Bible knows and has venerated from childhood. I need not recall the fact that it is the tree celebrated by Isaiah, and by David in the Psalms, that it is the tree that Solomon used for the construction of the temple, and Ezra used to finish the second temple; the tree which David used to build his palace, and which served the Hebrews for the masts to their vessels, and for the idols which this people, so often rebellious, erected, and which attracted to them the paternal punishments of God. I will merely add, however, that there are learned and competent students who suspect, at least, that in one or the other of the references of the Bible there is room for doubt, and that they do not refer to the true Cedar, but rather to the wood of the Cypress (*Cupressus sempervirens*). Indeed the wood of this tree, which still inhabits the valleys of the Lebanon in the immediate neighborhood of the Cedars, as in the valley of Kadischa, forming there dense forests, is more valuable than that of the Cedar both for construction and for the cabinet-maker. The wood of the true Cedar is whitish, rather soft, not very durable, and not odoriferous, while that of the Cypress is very hard, durable, very resinous, and of a handsome brown color, and in every way superior to that of the other tree.

I saw the Cedar for the first time in the Atlas of Beni Salah, which forms the principal part of the chain immediately behind the pretty town of Blidah, which is surrounded as far as the eye can reach by forests of Orange-trees, whence come in the months of December and January mandarins, which are

now beginning to take the place of all other varieties of the Orange.

We ascend with the aid of mules and Arab guides behind the town during five hours—for it is necessary in order to visit the Cedars to reach an elevation of nearly 2,000 feet, while Blidah is only a few feet above the level of the sea. We pass through Arab fields surrounded with masses of Cactus (*Opuntia Ficus-Indica*) fifteen or twenty feet high, and covered with the graceful *Clematis cirrhosa*, which, in January, was in full flower. Fig-trees without leaves, the great Caroubiers (*Ceratania Siliqua*), the *Zizyphus Lotus*, and a number of shrubs with shining evergreen leaves, grow on the sides of the road, with here and there an occasional plant of *Chamærops humilis*, which is the despair of the agriculturist of the country because it is impossible to exterminate its strong roots without the aid of a dynamite cartridge. We ascend rapidly; cultivated fields come to an end, and the naked flanks of the mountains, worn by the torrents of spring and deeply gullied, begin to fatigue our animals. We encounter at 3,500 feet thick clumps of the Oak, known to the Arabs under the name of "Ballus," the *Quercus Ballota* with thick, tufted, dark gray foliage resembling that of the Live Oaks of the southern United States. The large acorns are sold in the market of Blidah. They are not bitter, although rather astringent for a cultivated taste. We soon leave these Oaks behind. Chestnut-trees, although not indigenous, grow here vigorously, as do several shrubs of Europe, like the *Ilex Aquifolium*, the *Ruscus aculeatus* and the *Prunus avium*.

A little further and we reach the Cedars, which hereafter cover all the slope with an imposing solemn forest, which we admire in silence. They are, for the most part, ancient trees many centuries old, but there are also many young trees which form impenetrable thickets. Under the old trees the ground is open and hard, resounding like iron, for it is still frozen, and here and there are patches of snow. It is impossible to imagine anything more beautiful or more touching than these great trees standing in their silent majesty. The trunks have a diameter of four and a half to six feet, springing from roots twisting about like serpents; the bark is thick, channeled, dark brown. The trunk separates generally at the height of a man into vigorous, horizontal branches. This horizontal direction of the branches is repeated to the top of the trees, so that they consist of a series of flat stages covered with thick, intense verdure, but diminishing near the top, which ends in a thin, upright leader. Upon these branches the cones appear in great quantity. They are very beautiful, of a clear brown color, and covered with drops of white resin. The cones are just ripe, although the scales are still closed. A month later they drop, leaving the central axis, which remains on the branches for a long time. The leaves are short, very close together, entirely covering the branches, dark green on both surfaces, although on certain individuals they are silvery white, the contrast of color making an effect of surprising beauty. The height of these trees is not great, the highest, I should think, not exceeding 60 to 75 feet, but solidity and strength are expressed to a supreme degree in their habit. An examination of this forest shows, to our surprise, the *Taxus baccata*, the *Cratægus Aria*, the *Euonymus latifolius*, a great Juniper probably undescribed, not unlike *Juniperus Oxycedrus*, *Quercus Mirbeckii*, an evergreen species of the eastern Atlas, but rare in this region. It is not uncommon to see immense trunks of the Cedars torn, burned and whitened, either upright or prostrate on the ground. These are the victims of lightning or of fires lighted by the Arab shepherds, who like to set fire to a great tree to warm their hands.

From the summit of Beni-Salah, which rises a little above the last Cedars, and which is covered with a thick growth of *Bupleurum spinosum*, we obtained a splendid view which will rest always engraved in our memory. About us are the rocks and the gorges of the Atlas covered with Cedars, while developing at the right and left to a prodigious distance extend the ranges of the province of Oran as far as the great pile of mountains to the east of Algiers, the Djurra, with its heavy covering of snow. To the north stretches the great undulating plain, dotted with innumerable towns and villages, known as the "Metidga," and ending in the long maritime chain surmounted with that gigantic monument called "the tomb of the Christian," but which is, in reality, the mausoleum of the dynasty of the ancient kings of Numidia, of the time of Augustus and a little earlier; beyond the beautiful Mediterranean in its blue immensity appears at a distance of more than 150 miles. But what a contrast the view to the south presents! Beyond the arid plateau of the interior is seen, under a pure sky, the immense plain of the Algerian Sahara, another sea, but a sea of sand and of stone.

There is, further west, in another part of the Atlas, a region where the Cedar forms extensive and luxurious forests. This is the Teniet-el-Had, near Affreville. The Cedars here cover nearly 10,000 acres, and ascend to nearly 6,000 feet above the sea level. In the lower part of this forest the *Callitris quadrivalvis*, called "Thuya" by the Algerians, is found. It is a charming little tree, the near relative of the Frenelas and the Widdringtonias of the southern hemisphere, which supplied the ancient Romans the precious wood called "Citrus," for which they paid fabulous prices—as much as \$50,000 for a single table, and, according to Pliny, it was the great and wise Cicero who paid it. This wood is cut from the lower part of the trunk where there are numerous excrescences, and is really beautiful. It is light rose colored, regularly marked with dark red spots which form a delicate design. The great *Pistacia Atlantica*, the *Pinus Halepensis*, the most common Pine of Algeria, are found in this forest also. Many of the Cedars have here twelve to eighteen feet circumference of trunk. One of them, known as the "Sultana," measures nearly thirty feet around the trunk. The "Sultan," which is no longer alive, had a trunk circumference of nearly thirty-five feet.

The Atlas is not the only station of this tree in Africa. Beyond the Atlas and the grand plateaus of the interior, an immense mass of mountains exists in the province of Constantine, towering above the Atlas even at a height of nearly 7,500 feet. All this immense mountain region is covered with forests of Cedars which have absolutely the effect of our Spruces of the Alps, half covered in the snows of winter. From Batna one ascends in a few hours to the centre of this region. There are, at a lower elevation, forests of *Pinus Halepensis* mixed with *Juniperus Phœnicea*, which attain here a large size. Higher up the Cedars extend in all directions, and it would require days to cross these forests. The flora of these high mountains must be beautiful in summer. We only saw the remains of that of the previous year, but were able, nevertheless, to distinguish two species of Saxifrage, and a Violet, the *Viola Munbyana*, of which the seeds are now growing in our Alpine garden. At a single place in these regions in the Babor range to the east of Bougie, at an elevation of nearly 6,000 feet, M. Cosson discovered a small forest of an *Abies* which he mistook at first for the *A. Pinsapo* of Spain. It is, however, a distinct species—the *A. Babarensis* of Cosson or the *A. Numidica* with obtuse leaves, and more closely related to *A. Cilicica* than it is to the Spanish tree. It is a species which succeeds well in the gardens of Europe, although it never grows to any size.

Bâle, Switzerland.

H. Christ.

New or Little Known Plants.

Berberis Sieboldii.

THE Japanese Barberry, of which a figure is published on page 249, may perhaps be considered by botanists an extreme form of the common Barberry, which assumes very various aspects in the different regions over which it ranges from western Europe to Japan. From a garden point of view, however, it is abundantly distinct from all the forms of the common Barberry in cultivation, and Miquel's name of *Berberis Sieboldii* may therefore well be maintained in garden literature at least.

*Berberis Sieboldii** is, in cultivation, a stout, compact shrub, three or four feet in height, with angled branchlets covered with pale gray bark, and slender three-forked spines. The leaves have finely ciliate margins and are obovate, rounded or rarely pointed at the apex, and are gradually contracted below into short, broad petioles; they are chartaceous, becoming somewhat coriaceous at maturity, dark green and lustrous, rather paler below, two inches or more long and an inch broad. They turn in the autumn to the most brilliant shades of scarlet and orange. The flowers, with pale greenish yellow ovate petals an eighth of an inch long, are produced in racemes two and a half to three inches long, and are larger than those of the common Barberry. The fruit, which is bright scarlet at maturity, is oval or obovate and half an inch long. From the common Barberry this Japanese plant differs, therefore, principally in the ciliate margins of the leaves, which are never spinulose-dentate, except on very young seedlings; in their lustrous surface; in the bright colors

they assume in autumn; and in the rather larger, paler colored flowers and in the larger fruit. It is the most ornamental of all the Barberries of the *Vulgaris* section, and there are very few plants which equal or surpass it in the autumn color of its foliage.

Berberis Sieboldii appears to have been introduced into cultivation by Mr. Thomas Hogg, of New York, who found it near Hakodate, and who sent it to the Parsons nursery at Flushing, New York. It had previously been collected by Mr. Charles Wright, botanist of the North Pacific Exploring Expedition, at the same place. The plant has been distributed by Mr. Parsons, who sent it to the Arboretum several years ago under the name of "*Berberis Hakodate*." It is perfectly hardy, and one of the most ornamental and desirable of the Japanese shrubs which have been introduced into American gardens. C. S. S.

Cultural Department.

Notes on Shrubs.

THE Japanese Witch Hazel (*Hamamelis Japonica*) is commonly classed as spring-flowering in catalogues and general descriptions, but this season it proved a winter blooming plant, and when spring opened the pleasing yellow flowers of this shrub had been long past. It is extremely unlikely that these winter flowers will be followed by fruit.

But *Corylopsis pauciflora*, another dwarf plant of the Witch Hazel family, and also of Japanese origin, if well protected in winter, bears a profusion of flowers in the spring. It is a rare plant in cultivation in this country, and is not thoroughly hardy in all situations in the latitude of Boston; but it is well worth a little extra care and attention on account of its abundant pale yellow bell-shaped flowers, which appear in short clusters long before the leaves. At the Arboretum the first fully expanded blossoms were noted about April 17th; ten days later the plants were in fullest blooming condition, and they continued to have a pleasing and attractive appearance for a further period of ten days, or until about the end of the first week of May. The leaves begin to expand as the last flowers fade. Although flowering regularly for several years at the Arboretum, no fruit has been borne on the plants. The desirable qualities of this plant, however, cannot approach those of the Forsythias with their loads of bright yellow blossoms and large, free growing habit and thorough hardiness. Among seedling plants of the Forsythias there are sometimes slightly differing shades of yellow noticeable, a circumstance which will probably be taken advantage of by nurserymen who at present propagate the plants almost exclusively by cuttings or layers. The common, upright growing *F. viridissima* blooms fully a week later than those known under the names of *F. suspensa* and *F. Fortunei*, and, as a rule, it is not nearly so handsome and satisfying as the other species, which are better suited to those who have small grounds and space for only one Forsythia. If left unpruned a single plant of *F. suspensa* may in the course of time attain very large proportions, because the ends of the long, slender, drooping branches often take root when they reach the ground, and send up new shoots. In this way the original plant may spread over a large area and form a little forest of additional stems all about it.

Everybody has observed that the young, unfolding leaves of most trees and shrubs are of a much lighter green color than they are after they become fully expanded. The leaves of a few species and varieties appear almost yellow when they leave the buds. There is a form of the native Nine-bark (*Physocarpus opulifolius*, commonly known as *Spiraea* or *Neillia opulifolia*) which is esteemed by some people for the yellow color of its foliage, and which is often sold by nurserymen under the name of *Spiraea opulifolia aurea*. When the young leaves of this shrub are expanding they have a striking effect of yellow blossoms, and at a little distance the plants are not infrequently mistaken for Forsythias in full bloom. This yellow-leaved form of the species is sometimes met with growing wild along the banks of streams, especially northward.

There is a noticeable difference in the yellow color of the flowers of the Spice-bush (*Lindera Benzoin*) on different plants. The stamens and pistils are usually produced in separate flowers, and these staminate and pistillate flowers are generally found on different plants. The staminate flowers bearing the small yellow anthers naturally give a brighter aspect to the plants which produce them.

*Miquel, "Prol. Fl. Jap.," 1.—Franchet & Savatier, "Enum. Pl. Jap.," I., 22.

The Leather-wood or Moose-wood (*Dirca palustris*) of our northern woods bears the earliest yellow blossoms of any native shrub, unless we include stray flowers of the autumn blooming native Witch Hazel. It is not a showy plant, but on account of the early development (first week of April at the

much earlier, and occasional open blossoms may be found in the first warm days of spring. The cultivated Japanese species (*Andromeda Japonica*) has more handsome and larger flowers, but they are not to be relied on in this latitude. In spite of an unusually mild winter, and among plants in varying situa-



Fig. 38.—*Berberis Sieboldii*—See page 248.

Arboretum) of its modest blossoms it attracts attention, and it deserves a place in every shrubbery. It is a shrub which never requires pruning, as it is of slow, compact growth. There is no very early flowering, broad-leaved evergreen shrub so generally satisfactory as *Andromeda floribunda*. The racemes of white flowers are usually in their best condition about the first week of May, although they are conspicuous

tions, hardly a flower bud survived to open with those of its American congener.

The Leather-leaf (*Cassandra calyculata*) is another early flowering plant of the Heath family which may also be called evergreen. It reaches its fullest bloom at about the same time, but is not so conspicuous as the *Andromeda*, because the flowers, which are somewhat larger, are disposed in a

one-sided raceme and hang downward, so as to be partly hidden by the leaves. Although it is in some respects a more interesting plant than the *Andromeda*, the general effect in cultivation is less pleasing, not only because its flowers are half concealed, but because its foliage is not so bright. Before the best bloom of these plants has passed away another evergreen species, the so-called Water *Andromeda* (*A. polifolia*) opens its blossoms. This little shrub grows a foot or more in height, and in nature is commonly found in swampy situations; but it is easily cultivated in any good, moist garden soil, provided that it does not contain too much lime. The leaves are narrow and dark green above and white beneath. The flowers, which are borne in clusters on the ends of the branches, are nearly globular in shape and have a very small opening at the mouth. The color varies on different plants from white to a decided rose, but generally the color of the flowers is faintly rosy. This charming little plant usually flowers much later in its native haunts, but under the warmer influences of garden cultivation the flowers are developed in early May and last for a considerable time.

Spiraea Thunbergii is fast becoming popular and more widely disseminated. It deserves to be known to every one; for, besides being the earliest of its genus to blossom in the spring, its whole aspect is graceful and the delicate foliage assumes very bright and attractive colors in the late autumn and is persistent after many other shrubs have lost all of their leaves. At Boston it usually begins to flower in the latter part of April, and is whitest with bloom about the end of the first week in May. Three weeks later the seed ripens and falls to the ground, where, under favorable conditions, it at once germinates, and strong little plants may be produced before the end of the season. Many of the flower buds and some terminal shoots were killed during the past exceptional winter, but enough buds remained to develop fully and give the plants a very white and attractive appearance.

Arnold Arboretum.

J. G. Jack.

Notes on Hardy Plants.

ONE of the first native Phloxes to flower is the Ground or Moss Pink (*P. subulata*). Its natural home is on dry, rocky hills and banks, but it can be grown in any light soil. It is common in cultivation and forms dense mats of its creeping stems, so that when established and in flower it displays a solid mass of color. Its flowers are rose-purple, half an inch or more wide; the average height is about four inches. It is surpassed in the size and brilliancy of its flowers by *Phlox reptans*, a species growing much in the same manner, but two or three inches taller, and with reddish purple flowers, often an inch wide. This species is only a few days later than the Moss Pink, and can be grown in shady corners. Its natural home is in damp woods. In a moist, light soil it can be grown in open sunlight. It spreads from creeping stems, and a few plants set thinly soon form a dense bed.

Too much cannot be said in favor of the white California Trillium (*T. sessile*, var. *Californicum*), the beautiful dark green leaves, the large, almost pure white petals, often two inches long by three-fourths of an inch wide. The durability of both flowers and foliage and its perfect hardiness make it second in value to *T. grandiflorum* alone.

The first to bloom of our Dentarias (Tooth-worts or Pepper roots) is *D. laciniata*, a little plant six inches high, bearing a small corymb of pale purple flowers. This species grows in moist, generally in loamy, soil, and in the shade. It lasts but a few days, and its flowers and foliage are quite pretty.

The variety of the Bird-foot Violet (*V. pedata*, var. *bicolor*) is a smaller plant than the typical species, but its flowers are more strongly marked in color and it is one of our prettiest of Violets. It needs shade, or a partly shaded location.

Caltha leptosephala is a species from Oregon and Washington, with white flowers and roundish heart-shaped leaves, much resembling our common Marsh Marigold (*C. palustris*), except in color; but its white flowers are a poor substitute for the bright yellow ones in our species; they are not as large, nor are they produced in such profusion. It would be useful to plant with the common species for variety, and it seems to prefer moist or wet situations. I have not tested its hardiness, but think it is probably hardy enough for New England.

Dicentra formosa, an Oregon species, is now in bloom. Its foliage is quite pretty, and the flowers are half an inch or more long by two-thirds as wide, and of a dull rose-purple color, borne in small clusters on naked stems from the root, eight or ten inches high. It is an attractive plant, but not nearly as valuable in any particular as our eastern *D. exima*. This species is larger, with larger and more numerous flowers of a brighter

rose-purple color. It blooms from early spring until September. Its large clusters of showy flowers are on long naked stems from the root, and both leaves and flowers would be valuable in bouquets. It thrives in the shade, or, if in a light loamy soil, it will do well in open sunlight.

In many localities scattered over our meadows and pastures at this season of the year, wherever it can find a vacant spot in which to take root, may be seen in flower the charming little *Houstonia cærulea*, commonly called Bluets. The centre of the flower is usually yellow, but the outer portion varies from nearly pure white to light blue or pale lilac. It grows as commonly in places as a weed, yet it is never a pest. It is such a low little plant—seldom four inches high—and flowers so early before the grass has attained any size that it seems to be independent and harmless. It is a biennial, but it scatters its seeds, so that when once planted it continues to grow from year to year.

In the autumn of 1887 we received, from a correspondent in St. Petersburg, a few bulbs of *Fritillaria pallidiflora*. They were planted out and have stood two Vermont winters without protection. They have bloomed and borne seed each year. Unlike some other plants of this genus, this *Fritillaria* seems to propagate faster from seed than from scales. Its height is about one foot, and it bears from three to six large bell-shaped, pale yellow or straw colored flowers, an inch and a half long by an inch in diameter. These turn to a dull rose-purple with age. It is an attractive plant, and sure to become popular when more generally known. It thrives in almost any garden soil.

There is more than one form of the *Silene Pennsylvanica* (Wild Pink). We get from Pennsylvania a white-flowered variety which is not showy. But from other localities what seems to be the true type has beautiful pink flowers. It is not so easy to grow as the Fire Pink (*S. Virginica*), but when established will well repay the cultivator, and it comes into flower early. It needs to be set early the previous autumn in order to become established for flowering. Plants set in the spring do not seem to get established so as to flower the same year. It likes a thin shade and a fine loamy soil.

Southwick, Mass.

F. H. Horsford.

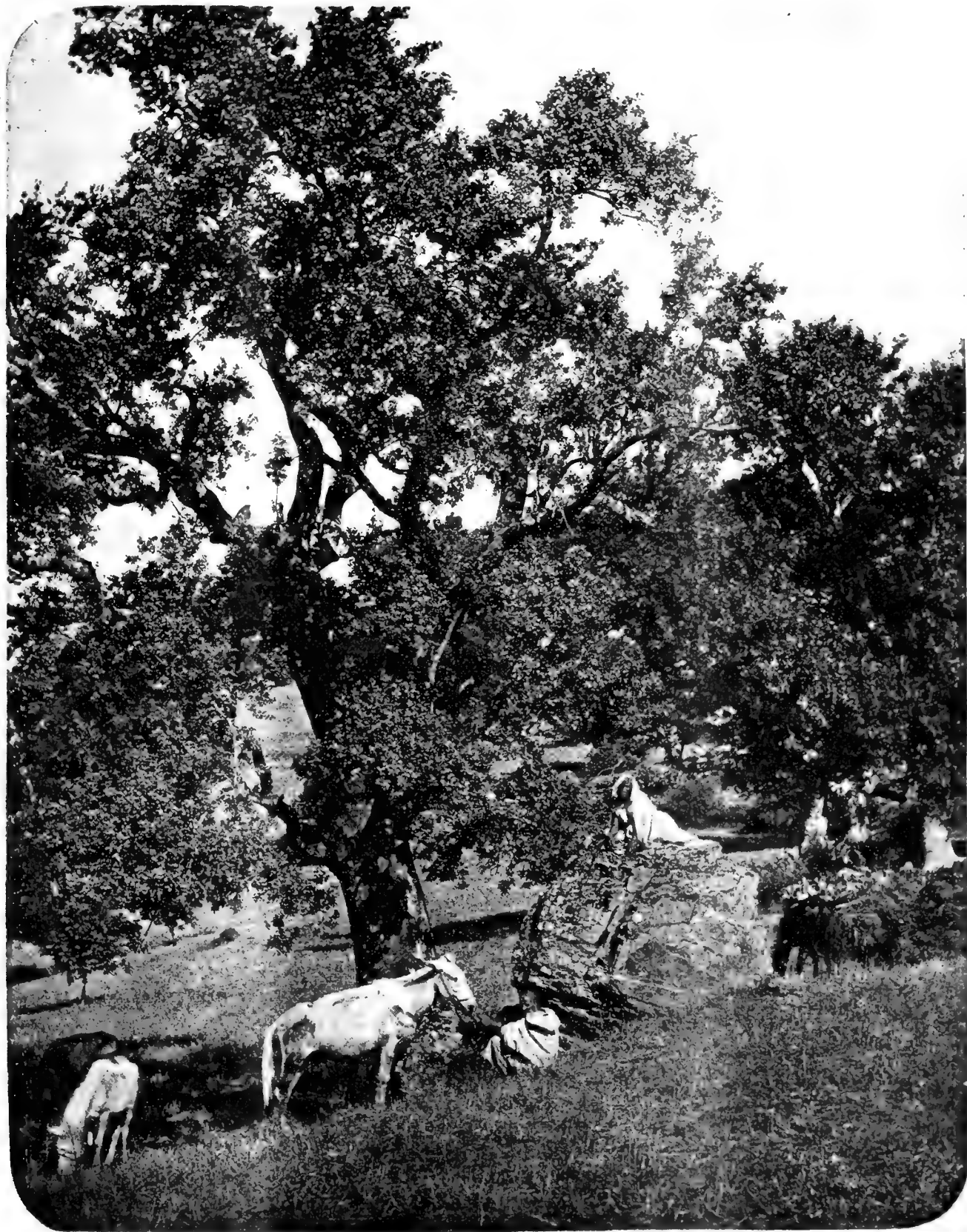
Hardy Plants for Cut Flowers.—V.

FEW of the Campanulas are useful for cutting, though all are good border plants, and most kinds are hardy. *Campanula persicifolia* and its many forms, especially the double white, are good for cutting. The double kind grows freely, is easily propagated by division, and the flowers last well when cut. There is a native species, *C. divaricata*, that can be used in the same way as *Gypsophila paniculata*. The small blue flowers of the Campanula have a pretty effect, for they are produced in the greatest profusion on much branched stems, one to two feet high.

Echinacea purpurea is a late summer composite, with large purplish flowers, which are very showy and durable. The plant lasts in bloom fully two months, and we have known flowers to last for weeks in water after having been cut. This plant is often sold as *E. intermedia*, which, with *Rudbeckia purpurea*, are but different names for the same plant. This *Echinacea* is thoroughly hardy, a native of the western states, and easily raised from seed, the seedling plants flowering the first year. Much has been said in favor of *Chrysanthemum maximum* for cutting purposes, and it certainly is a free bloomer, but *C. lacustre* is by far the best plant of the two for this purpose. It flowers at intervals all summer, while *C. maximum* gives but one crop of flowers inferior to those of *C. lacustre*, for these are larger, of good substance, on stems two to three feet long, white, with yellow centre. Both of these *Chrysanthemums* are easily propagated by division and are thoroughly hardy. *C. lacustre* prefers a moist soil.

We had been led to expect much from *Heuchera sanguinea* as a plant for winter blooming under glass. Our plants were strong clumps when lifted in fall, and were kept in a moderately warm house, but they are only just commencing to bloom on being planted in the open air. Judging from other *Heucheras*, it is doubtful if *H. sanguinea* would flower in the open in summer if forced during winter, but this does not detract from its value, as its hardiness is now fairly well proved. The elegant little coral red flowers, borne on long wiry stems, are sure to be appreciated wherever they are given a trial.

While on the subject of red flowers one is reminded that the old scarlet *Lychnis* is a good and useful plant that does not easily lose its hold on the appreciative public. It is a good perennial and very easy to propagate, as it seeds freely. The double variety is the best of the two for those who do not



The Cork Oak in Algeria.—See page 246.

object to a flower because it is double ; but unlike the typé, this may be propagated by cuttings only, and to secure these it is best, after the plant is past its flowering, to cut it down to the ground. Strong base shoots will soon spring up, and these may be readily rooted and will make good flowering plants the next spring. The double-flowered *Lychnis vespertina* is one of the very best double white flowering hardy plants for summer blooming, for it lasts in bloom with us for about three months. The beautiful double rose colored variety of *Lychnis viscaria*,

known as *Splendens*, only needs to be seen to be appreciated. It flowers in abundance, and is a good old-fashioned plant that is too seldom met with. These double *Lychnis* must be propagated by division.

The gorgeous Oriental Poppies last several days if cut just as the buds begin to show their color. They open perfectly in water ; but for those who do not care for their color the soft rose of the variety *Roscum* may perhaps be better appreciated. The plant differs only in the color of its flowers. It

is well known that Poppies die down in summer, and this suggests that some desirable annual be sown near them, such as Mignonette, to occupy the space.

The old-fashioned hardy Pinks are delightful border plants. There are perhaps only two kinds that are really hardy—that is, the pink and white. The florists' named kinds are more beautiful, but are not always able to survive the winters out-of-doors, although easily wintered in a cold frame, and they are well worth this little trouble. The easiest method of increasing the hardy Pinks is by layering in September, and these, when rooted and potted up, make nice stock for planting out in spring.

The Iris family is a numerous one, and to mention all that would be useful for cutting would be a difficult task. *Iris Sibirica hamatophylla* is now covered with dark violet flowers, and is one of the earliest to bloom, and certainly is the best of the Sibirica group. The leaves, while young, are blood-red, but afterward turn green, and the plant often produces flowers three times during the summer and autumn. No garden should be without the true *Iris Florentina*, with its exquisite pale lavender, fragrant flowers. It belongs to and is one of the best of the *Germanica* section, and is the plant from which the Orris-root of commerce is obtained. The varieties of *Iris levigata* are so numerous that one cannot say more with regard to them than that they last well when cut, the unopened buds expand in water, and that the more one grows of the better kinds the more the inclination to try others of the same section.

Passaic, N. J.

E. O. Orpet.

Stove Plants.

AMONG the many old-fashioned stove plants that are worthy of more general cultivation are some of the *Sanchezias*, a very effective group belonging to the *Acanthaceæ*. They are easily managed and of strong and rapid growth, and might be described in a general way as having somewhat the appearance of very strong-growing *Aphelandras*, the latter belonging to the same order. The *Sanchezias* here noted are natives of Ecuador, and should be grown in a warm house, tolerably shaded. They are propagated by means of cuttings, which root readily if given a brisk bottom-heat, and should be potted on from time to time as it becomes necessary, as when starved they are liable to lose their lower leaves. The flowers are tubular in shape, light yellow in color and produced in a terminal panicle. Their effect is heightened by their being partially enveloped by crimson bracts. The species to which special attention is called are, however, grown more for their foliage than for their flowers, though valuable for either. *Sanchezia nobilis variegata* is probably the most widely known species, and has large, opposite, single leaves, variegated with bright yellow, the variegation following the venation of the leaves. *S. glaucophylla* is another excellent species, and is distinct from the first-mentioned in various particulars, one noticeable point being found in the shape of the stem; that of *S. glaucophylla* being round, while the stem of *S. nobilis* is more or less winged. *S. glaucophylla* is also handsomely variegated with yellow, with the addition that the midrib of this species is bright red or crimson. The leaves of these *Sanchezias*, when well grown, attain a length of from twelve to fifteen inches and a breadth of four to five inches, and they possess much decorative value; but it should be remembered that to grow them well they need to be kept clean, both mealy-bug and aphid being very partial to them.

Duranta Baumgartii variegata is a pretty little shrub of South American origin, and though frequently found in a warm house, need not necessarily be grown in a high temperature, as it may be used for out-door work in summer. It has opposite leaves of fair size and marked with bright yellow. This *Duranta* is easily grown in light loam, but should not be allowed to become very dry or it will be attacked by red spider. Cuttings of soft wood root readily, and the young plants should be pinched back occasionally to keep them in shape, as the natural habit of the plant is somewhat straggling.

Mussaenda frondosa is a charming stove flowering plant from Ceylon, and, though in cultivation for many years, it is very seldom seen. It belongs to the *Rubiaceæ*, and would prove a valuable addition to many collections on account of the striking combination of colors in its flowers. The flowers are produced in racemes, and bear some resemblance to a yellow Jasmine; but they are surrounded with pure white bracts, the latter being formed by the enlargement of one segment or division of the calyx. *M. frondosa* is also increased by cuttings, which may be put in at almost any time, providing the shoots thus used be moderately soft, though as

this plant usually flowers in the late summer or in autumn, it is well to root the cuttings early in the spring, so that the plants may be grown on rapidly for fall use in the conservatory. The *Mussaendas* should be potted in a light mixture, equal portions of loam and peat, or leaf-mould, with some sand, making a satisfactory compost. The pots should be well drained, as the plants enjoy liberal watering during the growing season, and a moist atmosphere with some shade will be found beneficial. There are other species of *Mussaenda* besides the one referred to, some of which are but little known except to botanists.

Holmesburg, Pa.

W. H. Taplin.

Orchid Notes.

DENDROBIUM SUPERBUM.—This is a very handsome species of a pendulous habit, almost always becoming deciduous just as the flower-buds begin to grow; it has ovate-oblong obtuse leaves, which give the stems a very pretty effect after the growth is finished. The stems grow from two to three feet long, and from each side of these the flowers proceed in rows, each measuring three to four inches in diameter. They are of a beautiful rose-purple color, with a fringed, rich purple lip, marked with a pair of sanguineous spots at the base. They last in perfection three weeks, if kept in a cool, dry atmosphere. The flowers have a peculiar Rhubarb-like odor, particularly sweet early in the morning, when the sun shines on the house and before the ventilators have been opened. The plants here are in baskets suspended from the roof, in a light, airy place in the summer-flowering Cattleya-house. They enjoy a compost of fibre and sphagnum moss, with a little charcoal to keep it sweet. The plant likes a good supply of water when growing. It is most generally known under the name of *D. macrophyllum*, the name formerly applied to *D. Veitchianum*.

DENDROBIUM FARMERI.—This is an evergreen, compact-growing species, with delicately beautiful blooms and a habit similar to that of *D. densiflorum*. The stems are clavate, from a small knob-like base, and are deeply furrowed, so as to become quadrangular. At the point of the stems are three or four ovate, leathery leaves, and from them grow the beautiful, loose-drooping racemes of numerous flowers, which have ovate-obtuse sepals, the larger petals being yellowish white flushed with pink. The lip is straw colored, with a rich yellow centre, and is denticulate at the margin. It expands its flowers in April, and lasts several weeks in beauty when kept in a cool, dry place. We grow this species in baskets suspended from the roof, in the same way that we treat *D. superbum*. It likes a fair quantity of moisture when growing, otherwise it will become covered with thrips; it should be kept comparatively dry when at rest, or it will not bloom freely. We grow this in sphagnum moss, which appears to suit it admirably.

Staatsburg-on-the-Hudson.

F. Atkins.

CYPRIPEDIUM ROTHSCILDIANUM.—A plant of this beautiful *Cypripedium* is now in flower in the collection of Orchids owned by Hicks Arnold, Esq., in New York City. It is entirely distinct and a noteworthy acquisition. It is a vigorous plant, having stout, very broad leaves, from the base of which is produced a scape bearing several flowers. The dorsal sepal on first opening was white, heavily marked with broad lines of a dark purple; after five or six days the ground color turned to a light yellow. The petals, which measure from four and a half to five inches in length, stand boldly outward, and are striped and spotted with dark purple, the edges being furnished with numerous hairs. The staminode is a distinctive feature in this variety, being covered with bluish hairs. The lip is very similar to that of *C. Stonei* in shape; the color, however, is somewhat darker. The plant requires a temperature slightly warmer than the majority of *Cypripediums*, and dislikes being in a large pot. Peat, moss and turfy loam, in equal proportions, make a good compost. With a temperature of sixty-five to seventy degrees it will be found an easy plant to cultivate.

Summit, N. J.

A. Dimmock.

Fritillaria armæna.—This is a small sized species, about four inches high, from Asia Minor. The stems are clothed with pale green lanceolate leaves, and the dark purple, bell-shaped flowers, borne on pedicels an inch and a half long, appear singly or in pairs at the top. The pedicels turn downward at their extremities and thus the flowers assume the nodding position characteristic of the genus. At the Bussey Institute (a department of Harvard University), I noticed, during the latter part of April, a group of a yellow-flowered variety of *F.*

armena in an exposed border and it is quite as attractive as the type. The flowers of the species and its variety are almost three-quarters of an inch long and the same in width at the mouth. Both succeed satisfactorily when planted in the fall and given the same treatment under which Hyacinths and Tulips thrive. They are well worth a place among the sturdy little flowers of early spring.

Harvard Botanic Garden, Cambridge, Mass.

M. Barker.

Transplanting.—Nearly every vegetable will endure transplanting without permanent injury, and this practice simplifies garden work and adds much to the area of a small garden. Lettuce can grow a month or more in the seed-bed before the transfer; Beets sown in the same way can be set out in the garden when the ground is warm, and will be two or three weeks in advance of those planted from seed in the spring, and the roots, if pains is taken in the work, will be of good form; Peas can be transplanted into moist or well watered soil and will grow thriftily; Beans do best if grown in pots or flats, as many seeds in a place as would be planted in a garden, and, when well up, shifted dirt and all into the out-door hills about the 1st of June. By this method we get Cucumbers much earlier, and they can be grown to the third leaf before they are set. All forms of Cabbage, Onions and Celery should be transplanted; and melons in this way can be had much earlier. Parsnip, Carrot, Salsify and roots of that nature are not improved by transplanting.

Plants of any kind should be given a permanent home before they are overgrown in the seed-bed. Too large plants are less likely to make perfect vegetables than those set when at the proper size. Seedlings will only attain a certain point of growth in flats, and when this period of stagnation is reached no more growth can be expected without a change of soil or location. If the plants have good roots and are set toward evening in freshly prepared soil they will live. A strong wind is more destructive to young plants than the sun's rays, and if the soil is well prepared and pressed lightly about the roots, most plants will grow even in the sun without shelter. A bath in thin mud is a good preparation for the roots of some plants when they must be set in a dry time. Watering after or during the time of transplanting is much practiced, but, unless the weather is very dry, the plant will do as well without if properly set. Cabbages and like plants, if lifted a day before they are to be set and left in a cellar, will make a new growth of root, so as to gain rather than lose time by the day's delay.

West Springfield, Mass.

W. H. Bull.

Little Known Vegetables.—As stated by a correspondent on p. 228 of GARDEN AND FOREST, several European vegetables deserve to be better known in this country. We have few vegetables of better quality or of easier culture than Celeriac. It possesses plainly enough the delicious celery flavor and yet is sufficiently different from it to be a distinct vegetable. By packing in earth or sand the roots may be preserved in a cool cellar until spring without losing their fine quality.

I have always started the plants of Celeriac in the hot-bed or cold-frame, but I now think that if sown very early in spring on a nicely prepared bed in the open ground the seed would germinate sufficiently well to produce a good crop. The plants are hardy like those of Celery and endure frost well. They should be given rich ground and be well cultivated, but hilling up is not as essential as it is with Celery.

Another vegetable that should be more common in our gardens is the tuberous-rooted or Hamburg Parsley. This is truly a Parsley with a root the size of a small Parsnip and with a flavor peculiar to itself. The plants should be started in the hot-bed or cold-frame, as the seeds, like those of the common Parsley, are rather slow to germinate. When of sufficient size the plants may be set in a well prepared bed in the garden, in rows two feet apart. The roots are rather slow of growth, becoming fit for use in September or October. Like the Celeriac, they may be preserved through the winter in the cellar by packing in earth or sand.

To my own taste, both the Celeriac and the Hamburg Parsley are equal to Salsify as contributions to the table. To some, however, their peculiar flavors are less agreeable. I have observed that in many persons a taste for the characteristic flavors of vegetables belonging to the *Umbelliferae* needs to be acquired.

University of Wisconsin.

E. S. Goff.

Under the Roses.—Beds of hardy Roses are not attractive, either in the early spring, when the leaves are forming, or after the flowering period in June or July. I have found it very advantageous to plant between the bushes the yellow and blue varieties of *Viola cornuta*. A large Rose-bed in my gar-

den, thickly planted with *Viola cornuta*, var. *lutea*, is now a blaze of brilliant color. The plants reproduce themselves with great facility from seed, and in a few years numbers can be obtained. They also increase by spreading, and soon yield very large clumps. The seedlings vary somewhat in color and form as well as in foliage, but are almost always handsome, and frequently as large as an average Pansy and hardly less beautiful. They are also faintly, but distinctly, fragrant. They continue in bloom until late in the fall, but the flowers in summer are somewhat smaller, as a rule. Planted near Pansies the two forms hybridize easily, but I have not obtained any noteworthy flowers in this way. Two very fine new forms of *V. cornuta* are sold under the names of Admiration and Magnifica. These, perhaps, belong to the class of Tufted Pansies, and are respectively violet-blue and purple-violet. They appear to be not less hardy than the species, standing the winter in the open ground without other protection than the manure thrown upon the Rose-bed in the fall. The plants do very well even in a light loam, but require plenty of water in the summer.

Newport, R. I.

W. G.

Iris Gatesii.—Joining Mr. Orpet in his praise of *Iris Susiana*, I hope he will allow me to state that now we have a plant which excels it in beauty. *I. Gatesii* was discovered by Mr. Sintenis in the mountains of southern Kurdistan, and was introduced by me to Europe two years ago. The flowers on stalks as thick as a man's finger and twenty-five inches high, show well above the foliage. They are in some cases double the size of those of *I. Susiana*, and the coloration is not so sombre, but far more delicate and more beautiful. The ground color is creamy white, the very massive standards, as well as the falls and claws, are dotted over with very minute silvery gray points and also adorned with a most delicate network of silvery gray lines. The beard is ochraceous yellow, and, seen from a distance, the flower looks yellowish gray. This Iris has the largest flower of any of the genus so far known, and, apart from its size, the flower is striking and of a highly aristocratic appearance. There are, moreover, some other novelties coming on, one of which resembles *I. Susiana*, but with markings of a crimson color.

Baden-Baden.

Max Leichtlin.

Recent Publications.

Forestry in North America.—III.

Part II. sets forth the fundamental principles of silviculture. The author maintains, with justice, that the principles of silviculture hold good all over the world, but adds that the illustration of these principles must be taken from a limited area. For this purpose he has chosen the timber-trees of western Europe on the fiftieth degree of north latitude and the countries immediately to the north and south of it—in other words, the forest-trees of England, northern France and the greater part of Germany. These species the author does not attempt to describe; he assumes that his readers are familiar with them. The first chapter dwells upon the external conditions which influence the development of forests. He says:

"Soil, including subsoil, and atmosphere are the media which act upon forest-vegetation, and they together are in silviculture called the 'locality.' The active agencies, or factors, of the locality depend on the nature of the soil and the climate, the latter being governed by the situation. The sum total of these factors represents the quality or yield-capacity of the locality. The forester requires to be well acquainted with the manner in which soil and climate act on forest-vegetation, in order to decide in each case which species and method of treatment are best adapted, under a given set of conditions, to yield the most favorable results."

Every forester knows that, on good soil and under conditions otherwise favorable, a timber-crop is heavier than one of equal age grown under less favorable conditions. In the concluding section of this chapter the author shows how we may use this fact in order to assess the quality of a locality. Numerous measurements of woods of different species and ages, grown under different conditions, have been made in Germany on a systematic plan, and from the data thus obtained yield-tables have been calculated, showing the volume of timber produced at different ages on a given area by the principal species on localities of different quality classes. Using the yield-tables published for the Scotch Pine by Wilhelm Weise, now Professor at the Forest School of Karlsruhe, the author shows that at the ages of 50 and 100 years the volume per acre of timber only, not including faggots, in localities

which, according to their yield-capacity, are classed as first, second and third class, is as follows :

	I.	II.	III.
Cubic feet at the age of 50 years, . . .	5060	3940	2700
Cubic feet at the age of 100 years, . . .	8390	6410	4910

The figures of these yield-tables Dr. Schlich has found, to a certain extent, to be applicable to Scotch Pine-forests in England. Some of the data of those tables have already been used in the preceding remarks. They can also be used in order to assess the yield-capacity of any locality stocked with Scotch Pine in England. Eventually, similar yield-tables must be prepared for the principal forest-trees of North America, and this is a work which ought to be undertaken by the Federal Government, or by the governments of individual states, for the benefit of forest-proprietors.

Before, however, such work can be undertaken with any prospect of useful result, two conditions must be fulfilled: The first condition is, that a unit of measurement must be adopted for all classes of timber. In countries with the metrical system it is the cubic metre; in Great Britain, India and the Colonies it is the cubic foot—and this it may, perhaps, be found convenient generally to adopt in North America. The second condition is, that state forests are constituted, permanently demarcated so as to be safe against encroachment, and that their management is properly organized. Without such public forests it will not be possible to prepare yield-tables or to collect any other statistical data necessary to serve as a guide to forest-proprietors in the proper management of their estates.

The second chapter deals with the shape and development of forest-trees, but we can refer only to what the author says regarding height-growth. Building again chiefly upon researches made in Germany, Dr. Schlich explains how the different species have a different mode of height-growth. On page 163 an instructive diagram will be found exhibiting the relative height-growth of Spruce, Silver Fir, Beech and Scotch Pine in a locality of the first quality. At the age of fifty years the mean height attained by each species is as follows :

Scotch Pine,	64 feet.
Beech,	60 "
Spruce,	55 "
Silver Fir,	40 "

At a later age Spruce and Silver Fir take the lead, while Beech and Scotch Pine remain behind in the race; and when 120 years old the order of the species stands as follows :

Spruce,	118 feet.
Silver Fir,	108 "
Beech,	102 "
Scotch Pine,	97 "

Scotch Pine and Beech, therefore, make the principal height-growth during the first period of their life, whereas Spruce and Silver Fir continue to grow vigorously in height to a much greater age, Spruce more so than Silver Fir. The progress of height-growth of the different species is much affected by the character of the soil, by elevation, the more or less crowded state of the wood and other circumstances, but under otherwise similar conditions it will always be found that deep, fresh, fertile soil produces much taller trees than shallow, dry or rocky soil.

In the third chapter, which deals with the character and composition of woods, the author points out that the object of silviculture is not to rear isolated trees, but considerable masses of trees, forming more or less crowded woods. Pure woods consist of one species only, or of one species with a slight admixture of others, whereas mixed woods contain a mixture of two or more species. The advantages of mixed woods are clearly set forth, and the author's remarks on this subject may be specially recommended to the attention of proprietors and managers of woodlands in America.

The last and most important chapter deals with the silvicultural systems—that is, the different methods under which the creation, regeneration, tending and utilization of woods are effected. The three well known classes are: first, high forest, originating in seedlings, either self-sown or artificially raised; second, coppice, which regenerates itself from coppice-shoots; and third, coppice with standards, a combination of seedling and coppice-forest. The modifications of these three main systems are numerous, and particularly the treatment of high forest has developed in a great variety of ways. On this subject we must refer the reader to the manual. These are matters which can hardly be fully understood without opportunities for obtaining practical experience of forests treated under the various systems described. Such opportunities cannot at present be found in the United States. For

that purpose students will have to go to Germany or France. And this necessity of studying forestry abroad will continue until a commencement on an adequate scale has been made in the United States to manage forests on a comprehensive and well considered plan.

This remark must not be understood to mean that those who have not studied forestry in Germany or France are not competent to undertake the management of forests in America. A commencement must be made; the sooner it is made the better, and it would be a mistake to wait until a sufficient number of men, trained in their profession abroad, were available. Any one, however, who can afford the time for studying forestry in France or Germany will find such study the most useful preparation for forest-work in America. The different systems of treatment which have been developed in Germany for the Scotch Pine, the Spruce, the Silver Fir, the Oak, the Ash and the Beech cannot, as they stand, be applied to the forest-trees of America and to the widely different conditions of climate which are found in the different regions of the United States. New methods must be devised on the ground of actual experience in America, but a thorough practical knowledge of the European system will be found most useful as a guide. The operations that will most completely secure the regeneration of the White Pine, the Douglas Fir, the Redwood, the Long-leaved Pine and other forest-trees of North America, either naturally or by sowing and planting, will doubtless be similar to those which have been brought to the present state of perfection by the persistent labors of foresters in France and Germany, particularly in Germany. The same remark applies to all other operations necessary to organize the systematic management of forests in America, the demarcation of forests, the settlement of forest-rights, the division of the forest into blocks and compartments,—the preparation of working-plans, the arrangements for its protection and the organization of the staff of administration, the executive and protective officers. For the arrangement of all these matters in America the experience which has been gained in Europe will serve as a most useful guide, and it would be a waste of time, of strength and of money not to utilize that experience to the utmost. Hence it will be of great advantage in America, as it has been under analogous circumstances in India, if as many as possible of the foresters who are to inaugurate the new system of forest-management have received a thorough training in their profession, both practical and theoretical. Nor is there any doubt that under existing circumstances the forests of Germany or France, and particularly those of Germany, offer the best opportunities for such professional training.

Allusion has already been made to the necessity of commencing the collection of statistical data upon which to build yield-tables for the more important of the American timber-trees. This is only one of numerous important subjects which must be studied systematically by means of scientifically arranged researches, the object of which will be to ascertain mode and rate of growth, to determine the effect of different methods of treatment and to obtain replies to many questions connected with forest-management. It has already been said that the duty of conducting these scientific researches, which are necessary to aid systematic forest-management, must be undertaken by the state, because it is not likely that private forest-proprietors will devote their time and their means to such matters. Those who may undertake these researches should certainly have received a complete professional training in forestry and in the sciences upon which the forester's profession is built up. They ought to have seen themselves how such researches are conducted in those countries where forestry is best understood. A commencement of collecting statistical data concerning the forests of North America has already been made by the Forest Division of the Department of Agriculture; it is therefore reasonable to suppose that the state will undertake this part of the work. It cannot, however, be carried on with any prospect of satisfactory results unless state-forests in the different great forest-regions are formed and managed on a good system.

It might be deemed preferable not to attempt the systematic management of forests on a large scale until their scientific researches have given results which admit of practical application, and until they have furnished definite precepts for the treatment of the different classes of forests. Such a proposal should not be listened to for a moment. A commencement must be made at once; the sooner the better. The best must be done under the circumstances. There may be failures, and the best method of treatment will certainly not be hit upon at once. The shrewd common sense, the keen eye to business of Americans, aided by a good knowledge of forest-management as practiced in Europe, will eventually hit upon the

right method in each case. The art of treating the American forests to the best advantage must grow up as the result of practical work on a large scale. The development of systematic forestry in America, however, will be greatly aided by the experience gained in other countries, and Dr. Schlich's Manual will doubtless give a powerful impetus to systematic forest-management in the United States.

Bonn, Germany.

D. Brandis.

Correspondence.

Grapes for Home Use.

To the Editor of GARDEN AND FOREST:

Sir.—Mr. Powell's criticism of my list of Grapes for family use in GARDEN AND FOREST for April 30th, coming from an experience in a different latitude and soil, is valuable. This fact should be borne in mind by the reader, and it should be remembered, too, that the original information was given to a novice living in my latitude and having a soil differing from my own only in being more sandy. I concur in Mr. Powell's estimate of the quality of the Worden. I have been insisting on its superiority to the Concord in this respect for the last ten years, and yet we often hear it asserted that the Concord is the best Grape grown, and that Worden is only another name for it. I wish I could endorse the claim of Mr. Powell that the Worden keeps better and does not break (crack) so easily as the Concord. These have been its chief faults with me; but, after all, I am not certain that its resistive force in this respect is feeble than that of the Concord under the same conditions. A cross of Worden and Herbert would be desirable if it resulted in a "swapping of jackets."

I did not mention the Massasoit for the simple reason that it is a poor setter. El Dorado has the same defect. I have never yet been able to get a perfect cluster from either of them. Now, I should be grateful to Mr. Powell if he will teach me how to secure perfect clusters on these two varieties. Other growers accomplish this, and what is lacking in my soil or treatment I never could discover. The Lindley is also subject to the same defect with me, and so are many others of Rogers' hybrids. Herbert leads them all, as far as I have tested them, in size of berry; but Wilder exceeds it in size of clusters, which often weigh a pound and more, while half that weight would be heavy for a cluster of Herberts.

The quality of the Duchess is beyond question, but it is the first to show symptoms of black rot, and bagging the clusters before blooming has not entirely excluded the fungus. It is strictly a variety for amateurs in this locality, and requires much coddling for success.

I am glad to hear good words for Diamond and Hayes from disinterested sources, but these are comparatively new, and have not yet, with me, reached the five-year probation fixed by Downing as necessary for determining the proper position of a new Grape.

The time has passed when it was only necessary to plant the vines and allow them to take care of themselves. Success with this fruit, as well as others, in these days of insects and fungi, is only gained by constant and intelligent care. The hardest disease-resisting kinds are the only ones fit for indifferent and careless cultivators to plant. They can, if they will, learn valuable lessons from these, and be better able to care for the better and more civilized kinds.

Montclair, N. J.

E. Williams.

Durability of Fence-Posts.

To the Editor of GARDEN AND FOREST:

Sir.—I am told, though not authoritatively, that a fence-post will last much longer if put in the ground upside down. Can you let me have either a confirmation or refutation of this?

Mount Airy, Philadelphia.

B.

[Some years ago Dr. W. J. Beal, of the Michigan Agricultural College, selected sticks of thirteen different kinds of timber. Each stick was cut in two in the middle, and each of these was split, making four sticks from each one. One set was placed in sandy land, and the other in clay land; in each place putting near each other a stick "top end up," and its mate "bottom end up." In some cases those with top down lasted best; in some the reverse was true, while in others there was no perceptible difference. The conclusion reached was that, so far as durability goes, it made no difference which end of the post was set in the ground.—Ed.]

Plant Problems.

To the Editor of GARDEN AND FOREST:

Sir.—Two or three years ago a certain neglected meadow in this neighborhood was entirely covered with *Blephilia ciliata*, only a plant here and there of any other species being discernible, presenting in full bloom, as may be imagined, a scene of rare beauty—a vivid reflection of the sky's own blue. Next year the prevailing plants were *Lobelia spicata* (largely predominating), *Achillea Millefolium* and *Rudbeckia hirta*, conspicuously interspersed with *Lilium Canadense* and *L. superbum*, and only an occasional plant of *Blephilia* among them all. The last season, the third in order, I counted over a dozen conspicuous flowering plants all blooming at one time in charming prodigality and confusion—a veritable flower-garden of eight or ten acres in extent, and of Nature's own ordering—and the *Blephilia* still more rare, having practically disappeared. The plant in question being a perennial, what became of it the two previous years, and why, at least, could it not hold its own with some of the plants referred to?

In the late summer of last year the beautiful American Centaury (*Sabbatia angularis*) was here one of the most common of plants—freely distributed over neglected fields and waste places. For the five years previous, or since the season of 1884, when it was equally abundant, scarcely a plant was to be seen. During my ten years' residence here these are the only instances where I have known it to bloom thus generally. Why has a biennial plant grown and flowered at such rare intervals, and simultaneously over an extended area?

Fairview, W. Va.

W. E. Hill.

Recent Plant Portraits.

Botanical Magazine, May:

EREMURUS AURANTIACUS, t. 7113; a noble Asphodel from the Caucasus, and, like its congeners, a most desirable hardy rock-plant, although rather difficult to manage and requiring careful drainage to prevent the thick root-stalks from rotting during winter.

ABIES BRACHYPHYLLA, t. 7114; a beautiful hardy Japanese Fir, with broad, dark green, distichous leaves, quite white on the lower surface from the broad bands of stomata, and one of the group of Japanese trees of which *A. firma* should perhaps be considered the type. As the editor, Sir Joseph Hooker, points out, "no one but a botanist traversing the islands of Japan, with an eye especially directed to its Silver Firs, can determine whether species or varieties or synonyms are represented under the above names" (*A. brachyphylla*, *A. homolepsis*, *A. Veitchii*, *A. firma*, etc.)

PASSIFLORA MIERSII, t. 7115; a graceful Passion-flower from Brazil, belonging to the section Grenadilla; a slender glabrous climber, with rather small flowers with white petals and purple corona.

BERBERIS VIRESCENS, t. 7116; under this name Sir Joseph Hooker proposes a new species for a Himalaya Barberry, first detected by him in Sikkim in 1849, and recently introduced into cultivation. The flowers are small, a third of an inch in diameter, in fascicles or short racemes, and are sulphurous or greenish yellow. The fruit is oblong or narrowed upward, compressed, scarlet or black, and one-seeded. As this Barberry grows naturally at an elevation of 9,000 feet or more above the sea, it may be expected to survive the winters in our Northern States.

PRIMULINA SINENSIS, t. 7117; a very remarkable Gesneriaceous plant, with the habit and foliage of a Primula, a native of southern China. The lobes of the spreading corolla are white, with broad violet-purple borders. This botanical curiosity was introduced into England from the Hong-Kong Botanical Garden in 1887, and flowered last summer at Kew for the first time.

Notes.

The sixteenth edition of Dr. A. Garcke's "Flora of Germany" has just been published by Parey in Berlin.

The Garden reports that *Shortia galacifolia* has flowered at Kew, and "judging from its health and vigor, is likely to become popular" in England.

The corner-stone of the Washington Memorial Arch in this city will be laid on Decoration Day with appropriate services of a religious and military character.

The Garden (London) speaks of a seedling Tuberous Begonia, at the nurseries of the Messrs. Laing & Sons, in which the semi-double blooms of large size and rich self crimson have

florets whose edges are handsomely fimbriated. This is a new break in these plants, and such a margin will help to relieve the flower of any formality.

A German journal names *Gladiolus* Snow White as decidedly the best white variety of the flower and recommends it to the attention of its readers as an important American novelty.

The description of the Celtis or Nettle-tree, published some months ago in GARDEN AND FOREST, has attracted much attention in Europe, and a long abstract of it was recently published in *Gartenflora*.

It is said that this summer will be an exceptionally good time to visit the Yosemite Valley, as the snow-falls of the past winter were the heaviest on record and the volume of water in the falls will therefore be unusually great.

The proposed alteration of the tariff, by which a duty of twenty per cent. will be imposed on plants, was discussed at a recent meeting of the Philadelphia Florists' Club and a resolution protesting against the proposed duty was passed. It is claimed, however, that this resolution does not represent the true condition of opinion among the members of the craft in Philadelphia, as the resolution was passed by a bare majority in a vote comprising about one-fifth of the membership of the Club, and the question will probably be called up at another meeting.

The *Illustrierte Gartenzeitung*, of Vienna, says that *Primula obconica* was brought to notice in Germany by descriptions and an illustration, which, in 1886, it reproduced from an American journal. At a horticultural congress held two years later it was agreed that the plant "did not fulfill the expectations that it had excited," but, the writer continues, later experience has been different, as admirable plants of *P. obconica* were shown during the winter just past by all the florists of Vienna. Now he doubts, however, whether it will preserve its popularity, owing to the alleged poisonous character with which it is credited by American florists.

One of the large specimens of *Livistonia Sinensis* in Horticultural Hall, Fairmount Park, Philadelphia, has recently perfected its first crop of seeds. The plant is about twenty-five feet in height and it bore three large spikes of flowers which were followed by a liberal quantity of seeds, the latter setting in the spring of 1889 and ripening in April of the present season. As an instance of the readiness with which this species germinates, it may be added that some of the seeds that fell from the plant before the crop was gathered were found to have germinated while lying on the ground beneath, which was carpeted with *Selaginella*.

German horticulturists complain rather bitterly that it is difficult for them to compete with the firms which import flowers during the winter from southern Europe, and especially from the districts about Nice. They envy in this respect their brethren in our northern towns, where as yet all the flowers used in winter are grown under glass near home. They say that to grow Roses, for instance, as American florists grow them, in immense quantities for the mid-winter trade, would be a ruinous undertaking, their only profit coming from late blooming sorts which are in request after the end of February, when the southern supply falls off.

Columbines are now in the first flush of their bloom and beauty. Among the forms in flower are *Aquilegia Olympica*, *A. glandulosa jucunda*, *A. Canadensis*, *A. alba grandiflora* and *A. Sibirica*, with hybrids in great variety, double and single, long-spurred, short-spurred and no-spurred. The Columbines, ranging through reds, blues and yellows, seem to disprove the oft-quoted theory that these three colors are never found in the same genus of plants. Other hardy flowers which have bloomed during the week are *Scilla campanulata*, German Iris, *Anemone sylvestris*, the hybrid Violets known as "Tufted Pansies," and *Daphne Cneorum*.

California correspondents speak of the great success which has attended the "colony system" recently introduced in the southern part of the state. Tracts of land are laid out in small holdings and apportioned among a body of immigrants, who, upon their arrival, find everything ready for work. A body of colonists from Holland who arrived not long ago at Merced, found houses built and gardens and orchards arranged, more than two thousand acres having been planted with fruit-trees and vines; and fifteen English families were established a few weeks ago at Bakersfield, in Kern County, each receiving a forty-acre holding similarly prepared.

A considerable quantity of fine vegetables come to this city from Europe during the winter, such as Brussels Sprouts, with

Endive and other salad plants. Romaine Lettuce is now coming in from Long Island, but an occasional lot still comes from France. The imported Lettuce is very large and fine flavored and sells for \$2.50 per dozen. A few Globe Artichokes still arrive and sell for \$20 per hundred. The very finest heads are said to be raised in Algeria, whence they are shipped to France and are brought here in boxes of ice which are furnished by the importers. Last week a few of the melon-shaped fruits of the Pawpaw-tree (*Carica Papaya*) came into market from the West Indies and a few Cantaloupes from Cuba.

Mr. T. Laxton, well known as the originator of so many varieties of the best Peas, says that if all the advances in earliness claimed for new varieties within the past twenty-five years were added together, Peas could now be had before New Year's. And yet the claims of originators have not been very wide of the truth. For some reason, very early Peas tend to come later year after year. This may be because the earliest peas to ripen are lost before the crop is gathered for seed, and this constant rejection of the earliest seed tends to fix the habit of later ripening. It happens, too, that very often the earliest peas to ripen are used for the table and this helps on the selection for seed of the peas which ripen latest. This constant loss necessitates the production of new varieties by the careful selector or hybridizer. A similar process goes on in regard to the height of Peas, as the dwarfier plants get lost or left in harvesting and the tendency to revert to old forms asserts itself. In this way the so-called dwarf varieties come at last to be tall. Again, quality may deteriorate by cross-fertilization, so that these persistent tendencies can only be counteracted by constant watchfulness and the production of new forms.

Michigan is one of the states in which a bounty is paid for the extermination of the English sparrow. But according to a late bulletin from the Experiment Station of that state the bounty too often helps forward the destructive work of the sparrows by killing other insectivorous birds. Too many of the county clerks cannot distinguish the head of an English sparrow from that of a linnet or a thrush, and money is actually paid for the destruction of such valuable birds as the song sparrow, the red-polled linnet and the evening grosbeak—birds which are protected by the state, under a law which makes their slaughter a misdemeanor to which a penalty of five dollars is attached. The bulletin gives such illustrations and descriptions as will enable the officers to distinguish between the native birds and the foreign nuisances. Nevertheless the law should be amended so as to make it the duty of county clerks to inform themselves and to collect a fine for every native bird offered for a bounty. It is to be remembered that the English sparrows destroy fruit, grain and vegetables. They attack blossoms, young fruit and grain at harvest-time. They eat some insects, but they protect more than they feed upon by driving away native insectivorous birds. Wrens, martins, swallows, blue-birds and even robins and wild pigeons suffer from these marauders, who destroy nests, young birds and eggs for no other apparent purpose than to drive these birds out of the neighborhood.

It is interesting to find in the shrubberies near Mount Morris, in Central Park, a number of large well established plants of the old white Indian Azalea, *Phœnicia*, unharmed by the winter, and in full flower. The excellent condition of these plants testifies to the fact that the Indian Azalea, or some of its varieties, at least, can be grown in much more severe climates than these plants have been supposed capable of flowering in. Only a faint idea of the beauty of the Indian Azalea in flower is obtained by seeing it grown as a pot plant, as the flowers quite hide the foliage, and the real charm of their delicate colors can only be appreciated when the plants are brought into immediate contact with the bright green of the vernal turf or the dark green of some broad-leaved evergreen plant. Several varieties of these Azaleas could be grown, no doubt, in this climate if a little care was taken in selecting sheltered positions for them and in furnishing a slight winter protection; and the experiment is certainly worth making. Azaleas in cultivation are all derived from plants cultivated originally by the Chinese in the southern part of the empire, or from the gardens of central and southern Japan. The so-called Indian Azalea, or some of its forms, grows far north in Japan in a climate as severe as that of New England. It is improbable that these northern forms have ever been introduced into our gardens, where they are possibly destined to give birth to a new race of garden Azaleas, which, there is every reason to believe, will prove as hardy and satisfactory here as have many other plants from the same region.

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The Preservation of Natural Scenery.

THAT pleasing natural scenery has a positive value of its own is a proposition which will hardly be disputed, and yet few persons seem to realize that, if this is true, the destruction of such scenery must be a loss to the common wealth. Occasionally a community comes to understand that a placid, forest-bordered lake or a mountain stream tumbling through a gorge is not only a delightful possession, but gives an additional pecuniary value to all surrounding property. Now and again we hear of a rural community which, without any sordid motive, forms a generous trust to purchase some charming natural object to protect it from being vulgarized or destroyed, and to hold it free for public enjoyment forever. The preservation of Chittenango Falls (see vol. ii., page 373) affords a conspicuous example of this enlightened public spirit which cherishes natural beauty as an inheritance which should, if possible, be handed down without impairment to posterity. As a rule, however, no organized effort is put forth to protect these picturesque places from invasion, and one by one, especially in the more thickly settled parts of the country, the axe and fire, or the equally destructive holiday picnic, is robbing them of every element which makes them poetic or refreshing to the spirit.

A few weeks ago Mr. Charles Eliot invited attention in these columns to several fragments of the primitive New England wilderness which still survive within ten miles of the Boston State House. One of these is the steep moraine, upon which are grouped the great Waverly Oaks (page 85); another is the remnant of a Pine-wood; a third is a dark stream, over which, from rugged banks, hangs a forest of Hemlocks, and there are other bits of scenery equally characteristic and attractive. But even if there was a manifest desire to save these and other examples of unsophisticated nature, it would be difficult to do so under existing laws. The Chittenango Reservation was authorized by special act of the Legislature, although in this

state a general law has been enacted to provide for a body corporate with the power of succession, and authority to acquire lands and hold them forever for public use. A movement is now on foot in Massachusetts to "facilitate the preservation and dedication to public enjoyment of such scenes and sites as possess uncommon beauty or historical interest," under the auspices of the Appalachian Mountain Club. The scheme looks to the establishment of a Board of Trustees empowered to acquire parcels of real estate, and to hold them, free of taxes, open to the public. It was in the interest of this movement that a noteworthy meeting was held in Boston on Saturday last, at which a committee was appointed to perfect a plan under which it is hoped that private generosity will be able to rescue from danger many scenes of natural beauty and hold them for the enjoyment of coming generations.

The Yosemite Valley, the Yellowstone Park, the Niagara Reservation are examples of what government may attempt in this direction; but still more effectual than government aid would be an enlarged appreciation by the great body of the people of the soothing and uplifting value of beauty and grandeur in natural scenery. Such an appreciation would manifest itself not only in securing land for city parks or in saving to some town its deep glen, cool with falling water, tree-shaded and fern-embroidered. It would ensure for the parks proper planning and maintenance, and for the glen not only the mere preservation of its native graces, but the addition of a new charm to every feature by skillful and reverent treatment. It would be felt not only in a few isolated acres specially guarded by law, but over the whole face of the country. It would protect many a mountain slope from being scarred by railroads, when they could have been constructed as well without defacement of the scenery. It would be seen in the preservation of every pleasing prospect and in the treatment of every country roadside. But until there is a public conscience to protest against the obliteration of natural beauty wherever found, these efforts to save a little here and there deserve the active and hearty co-operation of all forward-looking and public spirited citizens.

IN a recent communication on the proposed changes in our tariff on lumber made to the *Canadian Journal of Commerce*, Mr. William Little, of Montreal, one of the best informed lumber-men of America, discusses the present condition of the standing pine in the states of Michigan, Wisconsin and Minnesota, once the chief source of the pine supply of the United States, and reaches the conclusion that the great White Pine-forests of this country have vanished practically for all commercial purposes. He takes, as an illustration of his position, the Pine-forests of the lower peninsula of Michigan, in which it was estimated by the officers of the United States Census that there were standing in 1880 29,000,000,000 feet of merchantable White Pine. In 1889 the editor of the *Chicago Timberman* made an investigation of the merchantable pine standing in the same region and found only 3,000,000,000 feet. Some of this was cut last winter, so that, if these figures are correct, there is not now pine enough in the lower peninsula to supply the saw-mills of the state for more than six months. It should be remembered, however, as Mr. Little points out, that there are still left gleanings from third or fourth cut burnt-over stump-lands which produce grades of lumber of very inferior quality, some Red Pine and some inferior Hemlock, which may keep the mills running for a short time.

Mr. Little then assumes that it is fair to suppose that the census estimates of pine standing in Minnesota, Wisconsin and the upper peninsula of Michigan were as nearly correct as experience has shown those of the lower Michigan peninsula to have been, and, taking the census figures of 55,170,000,000 and deducting the amount which has been cut during the last ten years, 37,451,341,338 feet—the figures recently prepared by the *North-western Lumberman*—he finds only about 20,000,000,000 feet standing in the

three states, from which must be deducted the cut of last winter, rather more than 8,000,000,000, leaving a little over two years' supply of standing pine in the whole of the north-west.

Correct estimates of standing timber are exceedingly difficult to make and to verify, but by a system of averages extending over very large areas comparatively accurate results can be obtained, and it is not probable that the figures given above vary very far from the truth. They are not needed, however, to prove that the time is at hand when the north-western states will cease to be great lumber producers. This is abundantly shown by the fact that the most intelligent lumbermen of that region have for several years been engaged in securing great bodies of Pine-timber in the southern states, and of Spruce and Redwood on the Pacific coast. The increased number of destructive fires in saw-mills all through the north-western states, which have been noticed during the last two or three years, is another infallible sign that their business is approaching the end.

There is no hope that these great forests, which have been wasted as forests have never been wasted before, will ever be reproduced. Their end finishes the prosperity of a large section of the country and marks a period of folly and extravagance which seems, as we look back on it, simply incredible. And yet these forests, if they had not been called upon to yield annually more than their natural yearly increase, and if they had not been wasted by needless fires, might have been productive forever, and insured permanent wealth and prosperity where ruin now stares the community in the face. National calamities like the extermination of our Pine-forests are slow in making themselves felt, and the closing of a saw-mill and the ruin and abandonment of a town have, at first perhaps, only local significance. In the end, however, the country wakes up to the fact that a few men have made themselves enormously rich, and that nothing is left but blackened stumps and barren soil to show where once forests existed; and that one of the principal sources of national wealth has gone forever. The exhaustion of the copper and iron ores of Michigan would be a far less serious blow to the prosperity of that state and of the country at large than the destruction of her forests of Pine, and yet for ten years the American people, fairly warned of what was coming, have sat quietly by and looked with barely a word of protest against the extermination of the forests in every part of the country.

The Major Oak.

THE "Major Oak" (see p. 263) is in the best state of preservation of any of the very old Oaks for which Sherwood Forest, in England, is famous; and it is one of the noblest, most vigorous and best preserved of the old historical trees of Europe. It is believed to be one of the oldest trees in England. Beneath its spreading branches King John may well have reposed six hundred years ago, after the fatigues of the chase. Robin Hood and his merry men must have known it well. Since this tree grew to goodly size, great things have happened in the world—the Crusades, the War of the Roses, the discovery of the New World; it has seen the monarchy of England go down before Cromwell and the Covenanters, its restoration and the final fall of the Stuarts, the advent of Protestantism, the birth of science, and all the growth and development of the last two hundred years which have made the greater Britain of the nineteenth century. Here it has stood, stretching out its sturdy arms while the centuries rolled by. Think what England was when the acorn from which this tree has grown dropped to the ground, and then consider what it is to-day! Think what this tree has seen and survived, and it will not be found easy to contemplate it except with awe and veneration. In all England there is not one other thing which has changed so little in the past five hundred years; unless, indeed, it be some other Oak-tree or some of those ancient Yews which, in

England, are more venerable and more unchanging even than the Oaks themselves.

Our portrait is interesting, too, for it shows the habit and appearance of a very old and well preserved European Oak, which our readers will be able to compare with the old Oaks which are found occasionally in this country, although we can hardly hope to match the "Major Oak" with an Oak of equal size in the northern states. There are, however, Live Oaks in the south and in California which exceed it considerably in girth of trunk and spread of branches. The "Major Oak" has always had, fortunately, room enough to grow in, and it is in a soil which is capable of producing large and long-lived trees. The trunk measures thirty-two feet in circumference just above the roots; five feet above the ground it girths thirty feet; the branches have a spread two hundred and forty feet across; numerous roots spread out, partly above the surface of the ground, for a distance of thirty feet from the trunk. The foliage is healthy and abundant, and shows that the tree is still in excellent condition, although the trunk has been hollow from time immemorial. The cavity is now seven feet in diameter and ten feet high.

The "Major Oak" stands in that part of Sherwood Forest which is known as "Birkland," on account of the presence of large numbers of Birch-trees growing among the Oaks. It is not very far from the village of Edwinstowe, outside of Thorsby Park, and on the property of the Duke of Portland.

Forestry and Economics.

AS a subject for economical discussion, forestry was hardly thought of in this country twenty years ago, but now one can hardly read a book or an article which treats in a broad way any question of economic science without finding the present state and future prospects of our forests used to illustrate or enforce the argument. Professor H. C. Adams, of Michigan and Cornell Universities, in his masterly financial treatise, "Public Debts," has this to say:

"It is an historical rule of wide application, that as countries become more populous and the social and industrial relations more complex, the functions of government must necessarily extend to continually new objects. This rule holds good now and in this country, and, in consequence, the question of the residence of new powers becomes more important year by year. Consider, as a simple illustration, the increasing necessity for care of the forests. The frequent recurrence of floods; the more rapid and marked alternation of drought and wet; the progress of farming toward the exhaustion of lands; all point clearly to the fact that the people of this country must soon turn their attention to the culture of trees. But this is a line of enterprise that individuals will not enter upon, because the returns in dividends are too remote from the first investment. It is a legitimate sphere for the employment of public credit, and the only remaining question is: Shall the enterprise be undertaken by the central government or by the local governments?"

In an article on the fall of the rate of interest, especially on securities of the best class, in a recent number of the *Popular Science Monthly*, George Iles says: "Does not cheap and abundant capital make it possible to conserve the Adirondacks as a state park, and as the source of the principal rivers of New York, and to establish a national system of afforestation?" The drift of Mr. Iles' argument is that while the rate of interest remained high there was no inducement to invest capital in an enterprise from which the return was so remote and so moderate. But the present rate of interest and its probable reduction to still lower figures make it necessary for capitalists to seek investments which would hardly have been considered a few years ago. The careful management of forest-property will yield an assured income and the time is at hand when it will offer fair attractions as compared with other fields of enterprise.

"A park is Nature made more beautiful, a garden is an enlargement of the house. Here should be convenience, decoration, nice care, and as much elegance as the owner's means will allow. The turf should seem a soft carpet bedecked with flowers; here should be found the rarest and most beautiful foreign plants, strange animals, birds of bright plumage, gay garden seats, refreshing fountains, cool shadows in thick-planted walks."—*Pückler-Muskau*, 1834.

Horticultural Education.

IT is not strange that there should still be those who question the value of a special education for the horticulturist. Similar doubts were once held concerning education in general, and they have arisen with each new enlargement or extension of educational methods; in fact, they have been dispelled only when experience has proved them groundless. These doubts no longer exist in regard to those technical subjects which were first taught in colleges; but college training in horticulture is of such recent date that it has enjoyed slender opportunity to prove its value. All analogy, however, insists that its results must be good. Much horticultural instruction is, no doubt, incompetent, and all of it is certainly incomplete; but the subject is capable of elucidation and application to the student. Teachers are largely self-taught, even in elementary principles, and lack the breadth of view which enables them to epitomize and generalize; a coming generation of teachers, starting with fundamental knowledge and with enthusiasm, must reap great harvests. Most of our teachers have had little practical experience, both for the reason that they are largely young men and from the fact that no institution yet exists in the country where diversity of good practice together with mental training can be secured. This much I have said by way of apology for what horticultural teaching has not accomplished; but the faults are not vital, but wholly incidental to new ventures.

Much of the disaffection concerning college training comes from a misconception of the relation which education bears to the man. Education does not make the man; it only influences him. Education builds upon the mental quality of the student, and that original quality largely determines the value which an education possesses. This fact is illustrated to every teacher who sees students going out from his instruction; one makes his mark, while his seat-mate, with equal facilities, accomplishes little. But this fact is not a disparagement of education, for it is no doubt true that both are better for their training. But whether the education pays its cost, depends upon the industry and faithfulness of its possessor. Education is simply capital invested; and no two investments are of equal value to their owners.

Disaffection is due also to the fact that a special education is commonly confounded with a trade. It is the aim of our modern technical trainings to attain both these ends, but they are not necessarily correlative. In fact, just here is where the present widespread discussion of horticultural education turns. The "rule o' thumb" should be learned before one enters college; it should be a part of a boy's bringing up. Or, if he has not had the proper bringing up, he must attain this simple handicraft as an auxiliary to his education; and it usually happens that our colleges are not sufficiently equipped with apparatus and instructors to give adequate instruction in all these directions. The teachers of horticulture all exercise the greatest care that instruction in handiwork shall be prominent, and this is essential, not so much, however, to develop skill in handicraft as a continual illustration of the interdependence of precept and example. But it is too much to expect that a youth whose mind is reaching eagerly for knowledge should acquire in the detached hours of a two or four years' training what an apprentice, who does little mental work, is expected to acquire in four or more years of steady application. Yet many writers seem to expect even more than this. In other words, a student should not be sent to college for the purpose of learning how to hold a plow, how to make a cutting or how to pot a plant. Hercules should not be called upon until there is something heavy to lift.

But, as a matter of fact, many young men are sent to college for this very purpose. I asked a class of sixty-four students how many had ever seen the operation of budding performed. One raised his hand. The other sixty-three were given instruction in budding so far as one man with less than two hours a day to devote to the labor could instruct such a number before the bark upon the Peach-trees "set." And many of them were the sons of fruit-growers! I often wonder how many of them derived any profit from the operation!

It is too much to expect that the student is to acquire a full trade in college. College work broadens him, strengthens him, inspires him; and the knowledge, which is everywhere incidental to his course, is always of practical use to him. If he does not learn how to bud while in college, he ought to be able to acquire the art quicker and grasp it more intelligently than if he had not had the training. Some one remarks that a college training does not teach a youth how to handle some new plant, that it does not enable him at once to discern its requirements. This is certainly true, but training does not

make him less able to discern them. Such matters are wholly empirical, and must be learned by the doing. But I should expect the educated young man to discern more readily than another, or, at least, to acquire a more complete knowledge of the matter, if both had possessed equal powers to start with. The illustration, however, is trivial. A college training is not meant to enable a youth to drive a nail without danger of pounding his fingers.

Comparisons are often drawn between graduates and ignorant men who are skilled in some particular work. Such comparisons are fallacious because they contrast things wholly unlike—mental training and mere handicraft. A graduate may not have had opportunities for learning that particular thing, but there are a hundred other things which he can do better than the workman. There are thousands of men who are more skillful in certain things than any professor of horticulture. There are thousands of men on the streets of Paris who can speak French more fluently than many professors of language.

But, after all, shall we hire college men for our gardeners? That depends upon what a gardener is wanted to do and know. If you want him simply to grow Lettuce, let the college man alone, for he has ambitions above you. If you want him to manage your place with tact and judgment, and grow Lettuce at the same time, you may find him better. If you find some uneducated man to suit, you will soon hear yourself remarking, "What a pity that man could not have had an education!" for you will feel that education ought to have made him still better. I know of many college-bred men who make the best of farmers and gardeners. And I know of a few who are failures; I often wonder what would have become of them if they had known less! But this whole comparison of the graduate with the apprentice is invidious. A man is valuable simply for what he is, not for what has made him.

Cornell University.

L. H. Bailey.

Plans for Small Places.

PLANS of four small places are herewith presented (see page 261), each showing exercise of judgment in the adjustment of buildings, roads and walks to special local circumstances. The problem in each case was to so manage the constructions necessary to convenience as to mar as little as possible whatever natural landscape advantages the situation possessed.

In the case of No. 1, outlooks to the west and south were limited by buildings and trees on the opposite sides of the streets. By placing the house, stables and yards near the streets, room was made for a symmetrical and comparatively spacious and sheltered lawn to the eastward. The more important rooms of the house look over a terrace upon this lawn.

In the second example the view northward toward the street is limited, while to the southward a superb distant prospect will be permanently commanded. The object has been to so place the stable, and the stable, kitchen and laundry yards, that they would not break in upon the southern outlook, while leaving the largest space of unbroken lawn in direct view from the principal rooms that could be reconciled with convenience. Walls overgrown with creepers keep the yards out of sight from the approach road.

The third case is that of a narrow lot between two streets not parallel one with the other. There is no distant prospect to be considered; but, again, the leading motive of the plan is to obtain as much unbroken lawn space as practicable, especially on the sheltered south side. The kitchen, kitchen-yard, stable and stable-yard, and the carriage-approach, are worked snugly into the north-west quarter of the place, and the principal rooms look upon pleasing, though confined, domestic, local scenes to the north-east and to the south.

The fourth sketch illustrates a cramped, tilted and otherwise difficult situation near the top of a steep hill, the lot being bounded on three sides by public streets. The position is elevated and a fine distant view will be under permanent command to the south-east. From the point A to the point B there is a continuous descent of eighteen feet. The main floor of the house is two feet below the street on the south side and ten feet above the street on the north side. The street on the south side is carried on a retaining wall of field stone built very roughly, without mortar, spreading toward the base and furnished with numerous pockets and deep crevices filled with leaf mould. Opposite the more important windows of the house the parapet of this wall is ten feet or more above the natural surface of the ground.

Between the base of the retaining wall and the house there is a slight ravine, providing for surface drainage, the north side of which constitutes a bank covering the high foundation

walls of the house. A walk, leading from the street on the south to the house, crosses this ravine upon an arch of field stone connecting with the stone of the retaining wall. Mosses, fern and creepers dress all this stone work, and the banks of the ravine are planted with shrubbery that will nowhere grow so high as to obstruct the outlook from the windows. Windows of the three principal rooms of the ground floor and the little terrace shown on the diagram all command the important view to the south-east. The upper windows look over the stable.

All these plans have been carried out with satisfactory results, and a more detailed account of the work on some of them may be given in a subsequent paper.

Brookline, Mass.

F. L. O.

[It is to be remembered that these diagrams illustrate simply the solution of the fundamental problems presented in each case. And yet the determination of the framework of the design is, of course, a matter of controlling importance, and the special training of the landscape-architect is needed at this point, if it is required at any. If his assistance is not invited until after the house has been located and perhaps built, he may find it impossible by the most skillful after-treatment to correct the fatal mistakes already made.—Ed.]

Notes on North American Trees.—XVII.

THE West Indian Birch, or Gum Elemi, one of the trees of tropical America which reach the shores of south Florida, has long been known to botanists as *Bursera gummifera*, the name given to it by Jacquin in his "Selectarum Stirpium Americanum Historia," published in Vienna in 1763, who there established his genus *Bursera*, or *Burseria*, as he wrote it, for this plant. It was well known to earlier botanical writers like Hermann, Plukenet, Browne, Sloane and Catesby, having been one of the first of the American trees to attract the attention of Europeans, who fancied that its resinous juices possessed special medical virtues. It was this plant, probably, which Linnæus, in his "Materia Medica" published in 1749, called *Simaruba*, considering it, perhaps, identical with the *Simarouba* of the Caribs and the inhabitants of Guinea (the *Simaruba amara* of Aublet), as not many years later he refers the *Simaruba* of that work to the *Bursera* of Jacquin. But previously to the publication of Jacquin's genus, Linnæus had described our plant in the first edition of his "Species Plantarum," published in 1753, as *Pistacia Simaruba*, and it was not until the publication, in 1762, of the second edition of the "Species" that he adopted Jacquin's genus, changing Jacquin's orthography to *Bursera*.

It may be mentioned in parenthesis that curiously enough the published date of Jacquin's work is 1763, and that that of the second edition of Linnæus' "Species" is 1762; still Linnæus quotes there correctly Jacquin's figure of *Bursera gummifera*, published a year later. The date of the publication of one of these books as printed must be wrong, therefore, unless, as is more probable, Jacquin submitted his figure and description of *Bursera* to Linnæus before they were actually published. This, however, is unimportant, and what I want to call attention to is the fact that the authors who have written of our *Bursera* since Linnæus have overlooked the description in the first edition of the "Species Plantarum," and the fact that *Simaruba* is the earliest specific name of the species, antedating by ten years Jacquin's name; and that the principle of using the earliest Linnæan specific name being adopted, our plant must become *Bursera Simaruba*. There can be no doubt concerning the identity of the plant Linnæus described as *Pistacia Simaruba*, for he quotes under his description the unmistakable figures of Sloane in the "Natural History of Jamaica," and of Catesby in the "Natural History of Carolina," while in the second edition of the "Species" he quotes as a synonym of *Bursera gummifera* his *Pistacia Simaruba* of the first edition. The case is a perfectly clear one, therefore, and the change of name is unavoidable if the principle, which seems correct, is adopted.

C. S. Sargent.

Foreign Correspondence.

London Letter.

MAY has brought sunshine with the showers which ought to have come in April, and the gardens are now delightful. Cherries, Plums, Pears, Barberries, Magnolias, American Azaleas, Laburnums and even Horse-Chestnuts are in all their flowery glory, beautiful to look upon and deliciously fragrant. In spite of a dry April and undue prevalence of east wind, the trees and shrubs are as luxuriant in new leaf and flower as one could wish. On the ground beneath the trees there are carpets of Bluebells extending as far as the eye can see in many places. Nothing could be more charming than the rich blue of the flowers of this plant used for covering naked places under trees or to give color to long sweeps of green lawn. Anemones of various kinds, including the brilliant scarlet *A. fulgens*, are largely employed for purposes of this kind at Kew. The effect of what is termed a natural arrangement of such plants is infinitely better than anything produced by planting them in formal beds. Tulips also are largely used for spring effect, and they may be made to add a wonderful amount of color and life to large gardens by planting them in positions where they can be seen at a distance. Arranged in set beds with an attempt at color design Tulips are stiff as ninepins and almost as ugly; but used with judgment and not too freely they are most effective. On a sloping, grassy bank on the sunny side of what is called the Wild Garden, a large number of Tulips have been planted in the grass, irregularly. The flowers amid the grass as tall as they are have a charming effect. Besides the best of the garden Tulips, including "Parrots" and "Darwins," some of the most beautiful of the species are largely planted at Kew. *T. Greigii*, grandest of all Tulips, its large, elegant cups of the richest poppy scarlet, ought to become as popular in the garden as "Emperor" and "Empress" Daffodils. It is a native of Turkistan, comparatively new, and as easy to cultivate as any Potter or Duc van Thol. *T. retroflexa* has tall stalks and a cup formed of long, pointed segments which are slightly twisted and recurved, whilst in color they are canary-yellow. *T. elegans* is similar in form to the last named, but deep crimson in color. *T. acuminata* is another of the same stamp, but the flowers are yellow with a tinge of red on the ends of the segments. *T. Kolpakowskiana* has a regular cup-shaped flower, rich cardinal in color, with a black eye-like blotch at the bottom of the cup.

CARAGUATA ANGUSTIFOLIA is one of the prettiest of the smaller Bromeliads. It forms a compact tuft of short stems and short, narrow, dark green leaves, from amongst which the flower spikes spring. These are five inches long, curved, as thick as a man's finger at the base, thickening upward, owing to the overlapping of the boat-shaped bracts, which are brilliant scarlet. The flowers are about two inches long and colored rich yellow. Several plants of it are now in flower at Kew, one with four spikes, although the plant is not a foot through, and nothing could be prettier. The species is a native of the Andes of New Granada, from whence it was introduced by the Messrs. Veitch, and distributed from their nursery in 1886. Most of the Caraguatas have large brightly-colored flowers and bracts, and they are easy to cultivate. To any one in search of a distinct, beautiful, little flowering plant I would strongly recommend *C. angustifolia*.

SOLANUM WENDLANDII.—This is by far the handsomest in flower of all the Solanums known to me; indeed, it is so superior a plant that one almost wishes it were called by some other name than Solanum. It is a stout growing climber, with fleshy, tubercled stems, large, entire or laciniated leaves, and enormous trusses of large, purplish blue flowers. A plant in one of the stoves at Kew has a stem thirty feet long, with short lateral branches, from which hang the flowers, the largest truss of which measures over a foot through. The flowers are not fugacious, as those of most Solanums are, and the plant will continue to develop bloom all the summer through. For this grand species we are indebted to Herr Wendland, of Hanover, who introduced it from Costa Rica. It revels in rich soil and plenty of water when growing, but during winter it should be kept dry. For large stoves there are not many plants that equal this as a flowering climber. There is a figure of it in the *Botanical Magazine*, t. 6914.

RHODODENDRON KEWENSE.—This is a hybrid obtained at Kew by crossing *R. Hookeri* with *R. Aucklandia*, where it flowered for the first time in 1878. A plant of it now flowering in a position where it has been slightly protected in frosty weather is a magnificent picture. The flowers are in loose, erect heads, about ten in each head. When in bud they are a bright rose-crimson; when fully expanded they are bluish white, cup-shaped

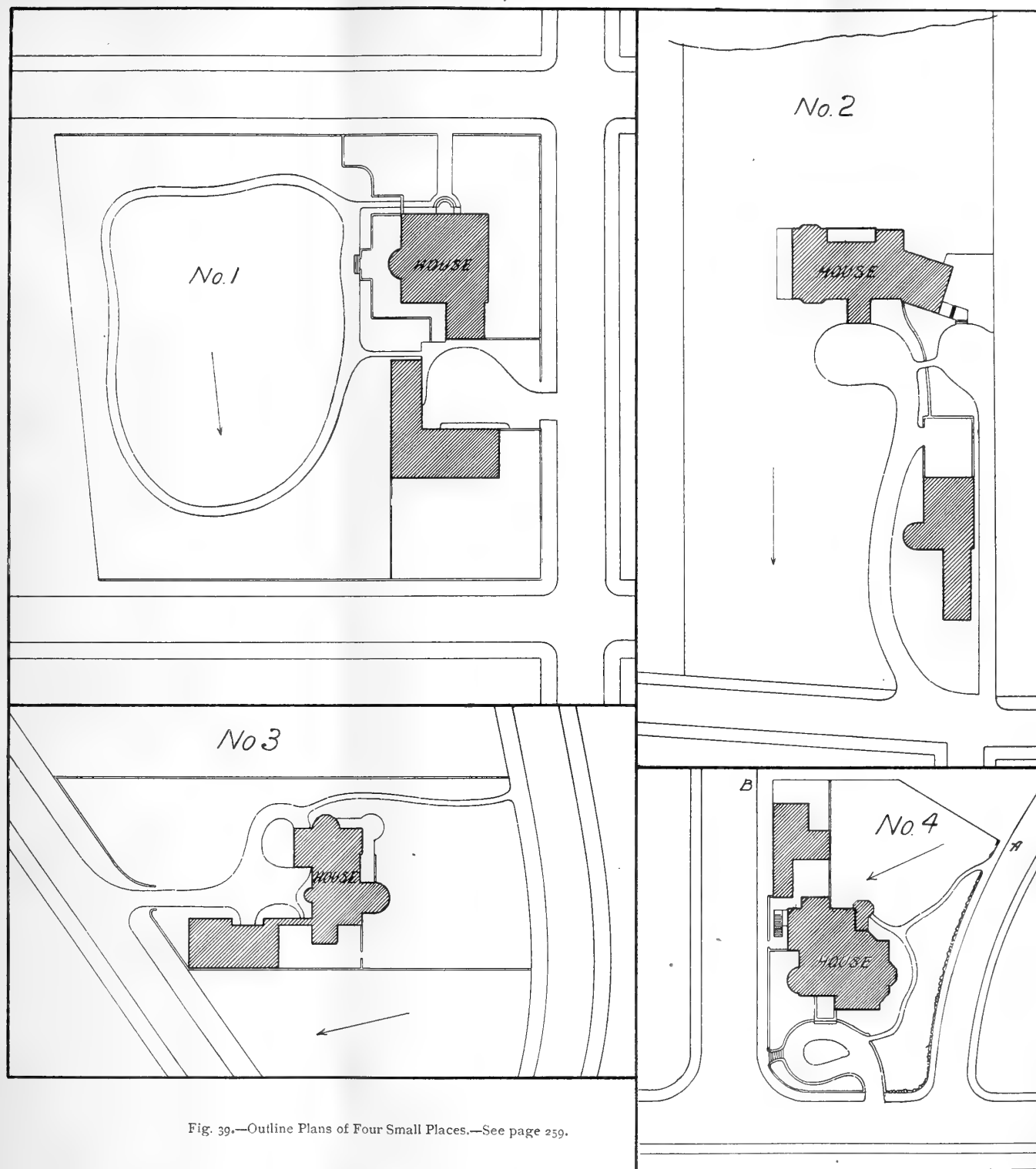


Fig. 39.—Outline Plans of Four Small Places.—See page 259.

and three inches across. The young leaves are subtended by large crimson bracts, and the effect of the whole is a rich glow. The plant is six feet high and nearly the same through, and it bears about fifty heads of bloom. It is the finest of all the hybrids hitherto raised from the Himalayan *Rhododendrons*.

R. AUCKLANDIÆ is also now finely in flower in the Winter Garden. There are few more noble greenhouse plants than this. It requires plenty of space, never flowering until it is eight or ten feet high, and it ought to be planted out. The flowers are in loose, erect heads, and each flower is at least six inches in diameter, saucer-shaped, and pure snow white. This species is as grand among *Rhododendrons* as *Magnolia grandifolia* is among its kind.

PTERIS ENSIFORMIS, VAR. *VICTORIÆ*.—This is one of Mr. Bull's new introductions from the East Indies, and it is so distinct in character, so graceful in habit and pretty in variegation

that it is certain to become universally popular as a decorative Fern. It belongs to the same group as the well known *P. cretica* and *P. serrulata*, but is distinguished by the tallness and erect habit of its fertile fronds, the pinnæ of which are very narrow. The barren fronds form a compact rosette and are broad in the pinnæ. The whole plant is green, conspicuously mottled and margined with white. Mr. Bull will, I believe, include this Fern in his list of new plants for sale this year.

STREPTOCARPUS DUNNII.—Of the many extraordinary plants introduced into cultivation from South Africa this is one of the most remarkable. Its solitary leaf sprawls along the ground like a huge Rhubarb leaf minus the stalk, whilst from its base spring crowded racemes of tubular brick-red flowers, the largest racemes containing as many as a hundred flowers. In the house devoted to succulent plants at Kew there is a row of plants of this *Streptocarpus*, numbering about fifty, and

they are now in flower, presenting a picture of the strangest character. Seeds are produced freely by cultivated plants, and the seedlings grow into full size in a year. The leaves are a yard long and about half as wide.

Strikes are the order of the day in England, and the discontent which leads up to them has affected the market-garden laborers of West Middlesex. Last week about 500 of them paraded the streets and demonstrated in Hyde Park. Leaving their work at this time of the year they have seriously crippled the masters, and unless an arrangement is soon arrived at permanent harm may be the outcome. From the men's standpoint, indeed from a common sense standpoint, the men's demands are fair and reasonable, and one hopes they may be granted. In America it will appear strange, perhaps, that men who are adepts in the work of growing flowers, fruit and vegetables for the London market, which means that they are grown as well as they can be grown; men who cannot be called mere laborers, because the work they perform requires skill and experience as well as endurance; that such men should have to strike to obtain wages of fourpence ha'penny an hour. This is the men's side. From the masters' side it has to be admitted that the price they can afford to pay for labor is regulated by the market, which is open to the produce of all countries. Put, say, ten per cent. upon the cost of the production of the market-gardens in England and probably the English produce will be beaten by the foreign. The lot of the market-gardener of London is not by any means an easy one.

CYTISUS ADAMI.—In the Coombe Wood Nursery of Messrs. Veitch, an interesting experiment is being made with a view to testing the theory that this *Cytisus* is a graft hybrid between *C. purpureus* and *C. Laburnum*. A row of plants of the last named have been grafted with *C. purpureus* and the results will be carefully watched. Messrs. Veitch have undertaken this experiment at the request of Dr. Romanes, an eminent English naturalist and a fellow-worker with Mr. Darwin. If the theory with regard to *C. Adami* is correct, it is strange that amongst the millions upon millions of grafted plants this is the only case of the kind that has occurred.

London.

W. Watson.

Cultural Department.

Orchard Experiences.—V.

THE "education" of an orchard (in the fundamental sense of the word) is the nicest and most important portion of the orchardist's work, and that which will both test and demonstrate his knowledge. A man who can take an orchard of even twenty varieties of Apples and train each one in accordance with its habit of growth into a perfect tree, is a worthy candidate for the highest degree of any horticultural college. Such work must begin with the young tree. It ought to begin in the nursery. It is a difficult task at the best, and most difficult of all with varieties unfamiliar to the operator.

There is an immense diversity of growth among different varieties. Some require almost no pruning at all, having but small tendency to multiply their branches; while there are other sorts very close-budded, and not a dormant bud amongst them all. Years ago a now eminent botanist suggested to me that the branching of an Apple-tree should be based upon its phyllotaxy—the side branches to be five in number, growing in an ascending spiral around a central trunk. I could never make this system work in practice, except with an occasional seedling, usually a Siberian Crab.

If Nature were sufficiently compliant I would start the head of every standard Apple-tree with but three main branches; but a danger in attempting this is that it may end in getting but two. Certainly, the main branches must be far enough apart in the beginning never to become opposite or nearly opposite. They ought to stand in some symmetrical order, so as to make an evenly balanced head, since a tree will always tend to lean toward its heavier side. In northern New England all orchards, the trees of which were set perpendicular, will in fifteen years lean, and most of their branches will point, toward the north-east. With a view to obviate this, many now lean the trees in planting toward the south-west, from whence are the prevailing winds during the period of active growth. These winds will, in the end, win the battle, though the contest is thus somewhat prolonged.

That pruning is best which keeps the tree in proper form with the removal of the least wood. "Penknife pruning" is strongly advised, and is the ideal method; but it demands eternal vigilance. Some varieties bear the removal of quite large limbs without much apparent injury, while with others the taking away of a limb an inch through will leave a wound that will never heal, soon making the trunk rotten and

ruining the tree. It has been often advised to cover all such wounds with some sort of composition or cement, or to paint them with a thick, ochreous paint. This does some good, but not much. If the variety is thoroughly hardy in the climate where it is growing a wound not exceeding an inch across will grow over in two seasons. If not hardy, the attempt to heal will be defeated by the winter-killing of the new growth, and the wound will tend to enlarge rather than heal, the tree becoming "black-hearted," breaking down and dying.

What is this disease of "black heart," about which so much has been written? It is simply the killing of the weakly vitalized heart-wood by low winter temperature. This takes place with different varieties at different temperatures. Is it the temperature at which the sap freezes, as Mr. Meehan has taught? I do not know; but this I do know, that nearly every variety of southern New England and the middle states becomes black-hearted in northern New England and Canada. If no wounds are made that will not heal in one season, such trees, "hardy, but not iron-clad," may live and bear much fruit before dying; but at last they perish when an over-crop breaks down the weakened branches or a phenomenally cold winter comes along.

Even with the most thorough iron-clads, I would paint and repaint every season, until healed, all wounds too large to heal in one or two seasons. From my experimental plantings, begun twenty-four years ago, I have been removing year by year a good many trees that have proved failures, or for overcrowding. Using the wood of these trees in my office stove, I have had a good chance to study their morbid anatomy and to trace the effects of cold and of pruning upon them. In every case of black heart from pruning, it has been easy to trace the course of decay inward and downward from the point of removal, and the lateral spread of the fungous disease which accompanies it, until the whole trunk is infected. There is no preventing or stopping this decay in any of the tender varieties. Once it begins, the destruction of the tree is sure. But in the "iron-clads," and especially in the Russian varieties, even when the wounds are large and have not healed over for several years, there is not a particle of decay or any fungoid infection. The woody fibres continuous with the severed branches show a changed color and seem destitute of life; but this wood is dry, hard and elastic, and the change does not extend to the contiguous wood. The wounds heal over perfectly, and there are no signs that the tree is not quite as healthy as others of the same variety that have never lost a limb.

Newport, Vt.

T. H. Hoskins.

Notes on Shrubs.

IN GARDEN AND FOREST for May 7th Professor J. L. Budd writes of the hardiness of *Prunus tomentosa* at Ames, Iowa. This little Cherry has usually proved perfectly hardy and borne an abundance of flowers and considerable fruit at the Arboretum, but this spring a large proportion of the buds and even some of the branches were destroyed, the injury being most severe to those plants on low, rich soil. This is a pretty little shrub with a broad spreading habit, specimens in the Arboretum attaining a height of five or six feet and resembling a very large Currant bush. It is one of the earliest of the genus to bloom, and when in good condition the branches are covered with medium sized white flowers, which usually have a more or less pinkish color. The flower stalks are so short that the blossoms appear almost sessile. The ripe fruit is of a light cherry-red color and has an agreeable flavor. It is a small Cherry and contains a large stone. Dr. Bretschneider collected seed of this plant in the mountains about Pekin, China, and as a rule it may be counted hardy in every way.

Among the four or five species of eastern North American Plums there is none so hardy or so showy when in blossom as the Wild Red Plum (*Prunus Americana*). In regard to hardiness it is what the gardeners term "iron-clad," and is found in the open woods far north in Canada. The vigor and endurance of the species in Manitoba and other equally trying regions where it is indigenous have in recent years caused some attention to be given to its cultivation and the improvement of the quality of its fruit. The fruit, which is either red, orange or yellow, varies much in size on different trees when growing wild. It is often of a pleasant taste and is sold in some northern markets. At the Arboretum the showy snow-white blossoms of plants from the north and north-west appear before the leaves during the first week of May and continue for seven or eight days, but it is noticeable that plants from Ohio are nearly a week later in flowering. When varieties of *Prunus domestica* and other cultivated Plums are very seriously affected by "black knot," the Wild Red Plum is often

remarkable for being free from it. As a stock upon which to graft many other species and varieties of the same genus this is one of the best. The little Beach Plum (*P. maritima*) comes into bloom as the last flowers of the Wild Red Plum fade, but although it blooms as freely, the whole aspect is different. The flowers lack the fleecy whiteness of the first species and as the flower-stalks are short they appear clustered on the branches.

Three or four species of flowering Currants attract much attention at this season. Of these *Ribes sanguineum* is unquestionably the most beautiful, although unfortunately the least hardy. In the climate of Boston it is necessary, if the plants are to do well, to give them more or less protection according to the situation in which they are placed. Although long known it is surprising that this beautiful flowering shrub is yet familiar to very few people. The plants grow well in any ordinary, moderately dry, warm soil. The racemes of bright, rose-red flowers are the only attraction of the plant, for neither the foliage nor fruit have any peculiar ornamental or economical value. The ripe fruit is small, black, tough, dry and bitter. The odor of the flowers and other parts of the plant very much resembles that of the cultivated European

so regularly attack the common red Currants and Gooseberries.

Ribes cereum is another rarely cultivated Currant from the western part of the continent, which, although not conspicuous nor large growing like the species already mentioned, has flowers of much interest and beauty. The blossoms, much hidden by the leaves, drooping and few on a raceme, are tubular and from a third to nearly half an inch in length, and of a pretty pinkish white color with a waxy appearance. The flowers of *Ribes aureum* and *R. cereum* are particularly rich in nectar and are much visited by long-tongued bees, and the long tubular calyxes of *R. aureum* are also regularly punctured by the mischievous Carpenter Bee (*Xylocopa virginica*), which is usually mistaken for a humble bee.

The first flowers in the paniced cymes of the early Red-berried Elder (*Sambucus racemosa*) usually open about the end of the first week in May, and continue for ten or twelve days. The flowers on different plants vary from greenish to pure white, and often have a reddish tinge, and when in full bloom they add much to the effectiveness of the shrubbery. Again at the end of June the ripe, bright red fruit is very conspicuous,



The Major Oak, Sherwood Forest.—See page 258.

Black Currant, though less rank. In cultivation there are varieties with flowers of various shades of color from deep red to almost white. As it grows at the Arboretum this species does not develop such tall and stout stems as the bright yellow flowered Missouri Currant (*R. aureum*) so common in cultivation. The flowers of the last species are spicily fragrant, and no part of the plant has much of the odor of the Black Currant, which is disagreeable to so many people.

There seems to be no question of the hardiness of this species even much further north, and it thrives fairly well in poor soils and in shady places where most other related species would languish. The fruit when ripe has a peculiar sweetish but not agreeable flavor. It is black or bluish black, and sometimes quite large, although exceedingly variable in size, and the berries are few on the racemes. These two western species are said to have been the parents of the hybrid *R. Gordonianum*, which in foliage and flower most resembles *R. sanguineum*. The hybrid has the erect, stout-growing habit of *R. aureum* and it also partakes of its hardiness. The flowers are practically odorless, and, as in the case of many hybrids, they do not appear to be followed by fruit. None of the preceding species are touched by the defoliating larvæ of saw-flies which

just at the time that the common Elder (*S. Canadensis*) begins to be showy with its large flat cymes of white flowers. There is a natural cut-leaved variety of the Red-berried Elder, which is likely to become more commonly seen in gardens.

Most of our native, as well as the foreign Alders, are characterized by very early spring blooming, but the Green Alder (*Alnus viridis*), a native of the northern and mountainous parts of eastern America, does not ripen its pollen until the blossoms appear on the Red-berried Elder. This little Alder only grows from three to eight feet high, and is the last of the genus to develop foliage in spring, the leaves not appearing until the flowering of the catkins. The sterile catkins are very handsome, being sometimes from three to four inches long and quite thick. When fully open the flowers appear light yellowish green under the shelter of the rich brown bracts. The sterile catkins are exposed all winter, while the small fertile ones are protected within large, reddish brown, scaly buds, thus differing from other common species, which have all the catkins exposed in winter.

The plants grow well in cultivation at the Arboretum and the foliage in summer is a handsome dark green.

Arnold Arboretum.

J. G. F.

Spring Flowering Iris.

TWO of the prettiest of all the spring Iris lately in flower are *Iris Persica* and *I. Rosenbachiana*. Other kinds now past are *Iris reticulata cyanea*, I. "J. G. Nelson," the bright little yellow *I. Bornmüller*, and we have had flowers of *Iris stylosa alba*, and the "Snake's-head," or "Widow Iris," *I. tuberosa*, a fragile little flower that has a sombre appearance, suggestive of apple-green satin and black velvet. The typical *Iris stylosa* of Algeria has yielded odd blooms ever since Christmas, and quite lately a large tuft of it, covered by a frame light elevated on posts, gave us quite a dainty crop of its soft lilac buds and blossoms. The typical *Iris reticulata* is after all one of the sweetest and most useful of all the spring blooming kinds, and has become luxuriant since Mr. Bedford, of Straffan, taught us the right way to grow it in peat, sandstone grit and cocoa-nut fibre refuse. The rich violet-blue flowers are deliciously scented, and our friends and visitors have been quite delighted with them this season.

One of my pet Irises is the old *I. Persica*, which, apart from its beauty, is quite of historical interest, since it forms No. 1 of that splendid series of plates issued in the *Botanical Magazine*. It was formerly the fashion to grow its roots in water-glasses, as is now occasionally practiced with Hyacinths, but in a deep sandy peat-bed the bulbs are far more robust, and more permanently healthy. The flowers of this species are of a delicate blue tint, verging to green, the hue of a thrush's egg, for example, and there is a velvety blotch on each of the "falls" around the end of the rich orange crest, and some dark dots and markings help to emphasize the satin-like delicacy of the petaloid styles, or standards, as Iris-lovers call them.

One of the most robust of all the newer species seems to be *I. Rosenbachiana*, which bears a bold little flower, similar in shape to that of *I. Persica*, but of a smoky lilac color, having a rich dark blotch on the falls, lit up by a vivid orange ridge or crest, on a nearly white ground. It is strong and beautiful, and promises to be quite an addition to a very beautiful group. So far as I have tried them, all the species and varieties of Iris are quite delightfully adapted for cutting, provided that they be cut in the full grown bud stage, and not allowed to open on the plant. *Iris reticulata* and all its forms, *I. stylosa* in variety, *I. Rosenbachiana*, *I. Persica* and all the great Flag Irises yield exquisite blooms as cut in the bud state and opened in water in-doors. Certainly if allowed to expand on the plants, or to remain long open in the open air, nearly all Irises are fragile and fugacious enough, and one might paraphrase old Robert Herrick, who lamented that the Daffodils "wasted away too soon."—*F. W. Burbidge in the Gardeners' Chronicle*.

Notes on American Plants.

THE California Pitcher-plant (*Darlingtonia Californica*) is now in flower here. Our plants were set in a moist place on the south side of a stone wall, which perhaps accounts for their blooming so early. The almost naked scape bearing the single flower is fifteen to twenty inches high, curving at the top, so that the flower is pendent or nodding, as is that of *Sarracenia purpurea*. The narrow, greenish straw-colored sepals are an inch and a half long. The purplish petals are an inch long by half as wide, slightly streaked with yellow, and only partially hidden by the longer sepals. In fully developed plants the long and peculiar pitcher-shaped leaves are very interesting. It is seldom that really fine specimens of this plant can be had from collectors, but we have seen such with beautiful long leaves over a foot in length. It is generally considered a difficult plant to grow, yet, I think, if in the right place, and with a protection of leaves in winter, it can be grown and flowered with success. It seems to prefer a black peaty soil. Ours, now set in sand, do not show health as we have seen it in decayed peat. In a boggy situation, set in peat unmixed with sand or gravel, we believe it would thrive.

Uvularia perfoliata, one of the Bellworts now in flower, is about a foot high, with light yellow or cream-colored pendent flowers, nearly an inch long by a fourth of an inch in diameter, and it has darker foliage than either *U. grandiflora* or *U. sessilifolia*. It seems to do best in a fine loamy soil. We have never succeeded with it in a heavy soil. It needs to be set in early autumn in order to flower freely the following spring.

The Scarlet-painted Cup (*Castilleja coccinea*) is a biennial, with a hairy stem and leaves. At the summit around the flower are so-called floral leaves, the upper portions of which are of a beautiful bright scarlet color, more showy than the flower itself. It may be easily grown in moist sandy soil.

Iris cristata, from the southern Alleghanies, which has been mentioned in former numbers of GARDEN AND FOREST, is one of our earliest of this genus, and is certainly for many loca-

tions a valuable plant, forming dense beds of its fresh green foliage, only five inches high, but thick and even, with an abundance of light blue and white flowers an inch and a half wide. If it did not flower at all, its foliage alone would make it worth growing. It will thrive in any well drained soil.

Camassia esculenta, from the Pacific coast, now in flower, grows from ten to twenty inches high, with long grass-like leaves from near the root, and bearing at the top a loose spike of violet-blue flowers, five inches long. The flowers are an inch or more wide and there are from ten to twenty on a spike. These are valuable for cutting. The bulb is easily wintered by protecting with a thin covering of leaves.

A rare and delicate little Primrose is *Primula Mistassinica*, found in only a few locations. At Willoughby Mountain, Vermont, it is quite abundant in places. Its height is from three to nine inches, and it usually bears in a small umbel several pinkish or light purple flowers scarcely half an inch wide. Its natural home is in the moist soil at the foot of wet rocks. It can easily be grown in a cool and shady place, in clay or gravelly loam, and will continue to flower from year to year.

Clematis ochroleuca is not a climbing species. It grows from ten to fifteen inches high, bearing numerous pale purple or nearly white flowers, three-fourths of an inch long by half an inch wide. The plant is not a very showy one in flower, but its plume-like fruit is pretty. In its general appearance it much resembles *C. Fremontii*, but the latter is a stronger growing species, with larger leaf and flower. This species has darker flowers, and is a more stocky plant when well established. *C. Douglassii*, of Oregon, is somewhat like the two just mentioned, but its flower is more showy than either, being a dark purple. The foliage is finer and more divided, and the plant is not so tall. All three come into flower at nearly the same season. They do best in open sunlight in light soil, and are interesting both in flower and fruit.

Fritillaria recurva, which has been mentioned in a former number of this paper, is now in bloom, and it is certainly one of the most attractive plants from the Pacific coast. The plant can be grown readily in a light loamy soil, with a thin protection in winter. It blooms early, and its scarlet, lily-like flowers are of long duration, and it will be very useful for cutting.

Southwick, Mass.

F. H. Horsford.

Hardy Plants for Cut Flowers.—VI.

THE best Ranunculus for cutting is the double form of *R. speciosus*. A patch of this variety is now a bright yellow, visible for some distance. This plant has flowers, large and very double, borne on good stout stems, and is far better than any other we have tried. It will succeed in any moist soil; the more wet the soil the better, so long as it is not liable to become sour. *R. speciosus* also increases rapidly and bears division annually. There is also now in bloom the earliest of the Pæonies—*P. paradoxa*. This species always flowers two weeks earlier than any other, and has large, deep rose-colored, single flowers, which are very showy just now, but two weeks hence would be invisible among the other varieties of garden origin; but flowering so early, it is an acquisition to the flower border. The foliage also of *P. paradoxa* is quite distinct from all others in being of a dull glaucous green.

Various kinds of Hemerocallis are also in bud, and the earliest, *H. Dumortieri*, has already opened some of its bright orange colored flowers. *H. Mittendorfiana* will soon follow; also *H. flava*, with lemon-yellow fragrant flowers, and last of all *H. Thunbergii*, which flowers in August, but is similar in color to *H. flava*. These are the four best of the Hemerocallis for cutting. The individual flowers last but one day, but the unopened buds expand in water in succession almost as well as on the plant. There is another Hemerocallis, with finely variegated foliage, known as *H. Kwanso variegata*, which is one of the best of hardy ornamental-leaved plants. It is liable to turn green sometimes, but if the green shoots are taken out when they appear the variegation can be held constant.

The best early herbaceous Anemone is *A. rivularis*. The flowers are pure white, almost as large as those of *A. Japonica*. They begin to open at the end of April, in May they are at their best, but they are produced at intervals all summer, so that this plant has considerable value for the border or for cutting. Many have seen and all have admired the graceful flowers of this, the so-called "Snowdrop Windflower," owing to the way the flowers are borne on the stems. We find *A. rivularis* succeeds admirably in the open border, and intending trying it in half shaded positions in masses, where the effect would be charming. One flower produces seed enough to raise a hundred plants, and these flower the second year, so there is no reason why *A. rivularis* should not be better

known than it is among lovers of heavy plants. The Hybrid Primroses have already been mentioned in GARDEN AND FOREST and it is surprising how little these plants are grown and known. We adopt no other method in winter than the placing of two boards, one on either side of the bed, to collect and retain falling leaves, and these are sufficient protection. The common English Primrose and Cowslip thrive under the same treatment. It should be stated that the bed is under the shade of overhanging trees, for we found that in our sandy soil the plants could not stand the fierce heat of summer. *Primula Sieboldii* is less known than the hybrid kinds, but it is perfectly hardy also, and being deciduous one can apply a top dressing of two inches of manure in fall, through which the young leaves and flower stems will push with vigor in early spring. The great value of *P. Sieboldii* is in the color of its flowers, which are of a deep rosy purple, and when flowering side by side with the hybrid varieties the latter look pale and washed out by comparison. The plant appears in many varieties, but none equal the type for brilliancy of color and stout, erect stems. We always sow all seed that ripens as soon as gathered; it sometimes takes six months to germinate, but the plants will all flower the second year and will show plenty of variation in size and color, and we have raised some of our best from seed saved from our own plants. *P. Sieboldii* throws its flowers well above the foliage on stout stems often a foot high, and these flowers when cut have a very choice appearance, for their color is not common among hardy flowers.

The native *Cypripediums* are now at their best. *C. pubescens* and *C. parviflorum*, with their yellow and brown flowers, are fully expanded, as is also *C. montanum*, a species from Oregon which is perfectly hardy in the east. The prettiest of all is *C. spectabile*, the "Moccasin Flower," and this flowers later than the others. These beautiful Orchids are very easy to grow wherever a shady position can be afforded them, for they dislike sun, and it is safe to say that although among exotic kinds of *Cypripediums* there are many weird and fantastic flowers, none of them can excel in beauty and delicate coloring the pretty native *C. spectabile*. E. O. Orpet.

Seasonable Hints.—The season is now sufficiently advanced to warrant the planting of all tender vegetables. Gardeners who made haste to plant them earlier will find that owing to the cold rains and low temperature of last week no time has been gained. If Egg plants are now set out they should be carefully watched, and if attacked by the Potato beetle should receive a dusting or sprinkling with diluted Paris Green. In planting Lima Beans it is good practice to set the seed eye downwards. The dwarf or bush Limas deserve a fair trial and may be planted about a foot apart in rows two feet apart. Corn fertilized in the hills will get a better start before the warm weather in which it makes the strongest growth. In setting out Tomatoes each plant should have three feet of room and when support is needed three stout stakes should be driven about each plant and about two and a half feet above the ground a barrel hoop should be nailed to them. The Dwarf Champion is of such a stocky habit that it does fairly well without support. Celery plants can now be had of the dealers and if set out at once in a deep, moist soil may be had fit for the table in August. The cultivation should be the same as for a late crop except that boards can be used to better advantage for blanching them than earthing up. Sweet Potatoes will grow best in a sandy warm soil, and placed in this latitude on slightly raised ridges three feet apart and about one foot apart in a row. Succession crops of Peas and Beans may be sown and the seed of Cabbage, Cauliflower and Kohlrabi may be sown for autumn crops.

The Flower Garden.—Plants for summer decoration may all be set out now. Many of them may occupy the beds which have been filled with Dutch bulbs, now done flowering. Hyacinths, Tulips and Narcissus can be bought so cheaply that they are hardly worth the labor of preserving; but if it is desirable to keep them, the best plan is to allow them to remain until the leaves begin to wither. They should be then lifted and set close together on the surface of the ground in a sunny position and covered with an inch or so of soil or sand. In about a fortnight the bulbs will be ripened, when they should be taken up and dried in the sun for a couple of hours and they will then be in proper condition to store away for planting next fall. Shallow cultivation should not be neglected in the flower-beds, for this keeps down weeds and preserves the moisture. Wherever mildew appears the flowers of sulphur should be applied at once.

Bergen, N. J.

P. O.

The Forest.

Forestry in Northern Ohio.

IN this region it would seem that two essential conditions are required for the reproduction of forest-timber. First, a few trees of the kinds that will be most needed in the future must be spared to disseminate their seeds. Second, cattle must be excluded. The case is complicated when birds and rodents destroy the seeds of certain species. In the case of the Magnolia there are sometimes no seedlings near the parent tree, but we are surprised to find them coming up a long distance away, since the seed could not have been carried by the wind. It has been suggested that the blue jay picks the red berries out of the Magnolia fruit or "cucumber," and the nutlets within escape digestion, and are scattered. This is made probable by the young Magnolias we find on the forest-border near corn-fields, places of resort for the jay when corn is ripe. The seeds of the Whitewood (*Liriodendron tulipifera*) are blown by the wind 300 to 400 feet at least, as are those of the Maple and several other trees.

But these essential conditions have been almost wholly neglected. During from sixty to eighty years the young of our forest-trees have been fed to the cattle, and that amount of time has been lost. In many cases no trees of the most desirable kinds have been left to produce seeds. On the contrary, the trees which are left in abundance are the least valuable. It is as though a farmer should destroy his seed corn, but allow the weeds to ripen seeds by the million. It is the survival of the unfittest. Beech, which is of little value here, is left in greatest abundance. It is a fine and useful tree in the original forest, the trunk tall and straight, but on the borders and in openings made by cutting out other trees, the smaller Beeches send out large laterals near the ground, and are practically worthless. Many of the Sweet Gums (*Liquidambar styraciflua*) have escaped destruction because of the difficulty of hauling them out of the wet places where they thrive, and they are now really valuable trees. The Birches which are found near them in the wet grounds are small trees, and are seldom used. Many fine Sycamores have also been left because they are not easily accessible. They stand on the bank of the river, leaning toward it, or are hemmed in by impassable sloughs.

The Sugar-Maple is an exception to the statement that the unfittest of our trees have survived. It heads the list of trees that pay yearly dividends while they live, and are valuable for lumber, fire-wood, etc., when they are cut down. A farmer who has a sugar-orchard and a dairy compares his Maple-trees to his cows, which are made into beef when they are no longer profitable for butter. The Hickory, Chestnut, Walnut and Butternut may yield delicious fruit year after year for a century or more, and make lumber in the end, but it is a common remark here that no other crop the farmer can produce pays him better than the sugar crop. How unfortunate, then, that cattle have been allowed to destroy the young Maples in nearly every sugar orchard in the country. The Maples that have yielded sugar from twenty to eighty years or more are growing old and dying out, and there is no rising generation to succeed them. They are wonderfully prolific, and the young ones thrive better the more other timber is thinned out. Fence out the cattle, and a thicket of young Maples will spring up to take the place of the old trees that are passing away. Neglect to do this, and it will soon be too late.

One objection which is urged against the exclusion of cattle from the sugar-orchard is that the undergrowth which springs up blocks the way, and hinders the gathering of sap and the getting out of timber and fire-wood. But it costs but a trifle to mow the usual roadways and passages close to the ground once or twice a year. But if it is too great a hardship to exclude the cattle permanently, keep them out at least until the tops of the young Maples and other desirable trees have grown above the reach of their teeth. Sometimes about two-thirds of the young growth is Ironwood. I should cut out the parent Ironwoods and other undesirable trees to prevent their seeding the ground. It is sometimes said the profit to be derived from the protection of a new growth is so far in the future that even our children will not live long enough to receive any benefit from the results. This is a mistake. It does not take several hundred years, as many suppose, for trees to grow and become useful. I know of whole orchards of Maples that could have been cut down with a pocket-knife when I first saw them, and which are now magnificent trees, the yield of sugar to the tree being above the average.

Forest-fires are infrequent with us. The wood-lots being small, from a quarter to a sixth, probably, of the whole area,

and being surrounded by cultivated fields so much larger, no fire can spread far. When fire does any considerable damage it is the result of carelessness on the part of wood-cutters, who leave the brush strewn over the ground. If the brush is properly piled, and every few rods a space is cleared of dead logs and branches, a few men can prevent any fire from spreading. I lately visited a piece of woods a few acres in extent that I saw burned over early in the summer. It was in one of the few blocks of forest in this region from which cattle have been excluded for a number of years. The young Hickories, which have deep tap-roots, are sprouting up again vigorously, but the fire seems to have killed all the little Maples.

With the destruction of so large a proportion of our forests have come great changes in our streams. Formerly the water of the snow and rainfall of winter and spring was held back by the shade, and by the accumulation of porous mulch and swamp deposits in the forest, and it flowed more steadily into the streams during the whole summer. Now the water from heavy rains dashes rapidly from the land into the streams, carrying away immense quantities of soil from the plowed fields, filling the rivers with mud, and causing disastrous floods in the Ohio and its tributaries. The undergrowth of the forests being destroyed by cattle, the wind sweeps freely under the trees, the leaves containing the fertility of the forest-soil are blown into the water-courses and lost in the floods. Thus the soil of the whole region, in field and forest, is growing poorer from this cause as well as others. The primitive store of forest-carbon which made our virgin soils so black and mellow, which by its slow oxidation has produced the acid solvents to digest rocky silicates and liberate their imprisoned plant-food, and which by the same slow combustion has caused the formation of those compounds of nitrogen which are the vitality of soils—this store of forest-carbon is fading out, leaving the soils hard and poor. On the other hand, the streams fall so low in summer that it seems probable that some of them would go dry entirely during the hot months if all our forests were destroyed. It seems, too, that the destruction of our forests tends to produce extremes of climate, colder in winter, and drier and hotter in summer, with less rainfall when it is most needed. The water held back by forests in summer tends to cool the air and promote rainfall.

The past history and present condition of our forests are full of admonitions. If population continues to increase, and the present treatment of our forests is continued, some of the children now born may live to see the people burning brush, weeds and corn-stalks for fuel, as is done in some older countries. Our improvident methods tend to destroy all our natural resources and reduce the coming generations of our country to a condition of poverty and want like that of Italy. Our stores of coal are being wasted even more rapidly than our timber. In the Hocking Valley, I am told, only about one-third of the coal in some mines is brought to the surface; the other two-thirds, being of a poorer quality, is hopelessly wasted in the mire of the worked-out mine. When we visit our lumber-yards and pay a good deal of money for a little Michigan lumber for necessary repairs, memory goes back to the time when we had abundance of White-wood and Cucumber, even for barn construction, and the imagination goes forward to the future, and we wonder where the luxury of a little lumber for any purpose will come from when the Michigan Pines are gone, as lumbermen from that state tell us they will be in a few decades at the present rate of consumption; for the hope of future Pines is blotted out by the great fires that follow the axe in that region. How much better for the generations that are to follow us if a few White-woods could be growing here now for their use. How much better for them to import more of some lighter product of the soil from other states, and pay less freight on the lumber which must then come from distant lands. The present tariff on lumber does not seem to promote the production of trees, but rather their destruction.

What can be done to initiate a more rational treatment of our forests? First of all, the people must be enlightened in forestry matters. The majority of land-owners see nothing wrong in present methods. Many do not even comprehend the reproduction of forests in accordance with the laws of vegetable growth, but suppose that young trees spring up without seeds, by "spontaneous generation" or some magical process. Few owners feel that they have any personal interest in the future of their forests. Most of them regard such considerations as impractical and visionary. This state of mind must be corrected by an enlightened public sentiment. I well remember when the market value of land in this region was not diminished by cutting off the valuable timber on it. It was a common remark—"I can sell off the timber for more

than the land will bring, and can then sell the land for as much as though I had left the timber standing." This abnormal state of the land-market was the result of deplorable ignorance on the part of the general public and of those who purchased land. To-day the man who pastures his forest-plot and cuts off the hope of a forest for future needs, can sell his farm for just as much, other things being equal, as can the more civilized and provident man whose forest-plot is covered with a young growth of valuable trees. Enlighten the public regarding forestry subjects and the market will recognize the value of the growing crop of young timber, as it now does that of the crop which is full grown and ready for use. Under the influence of an intelligent public sentiment a man will care for the future of his forest, and its consequent increase in market value, as thoughtfully as he now does for the market value of his horse. Other corrective influences might be considered, but one must serve as the concluding word. We need most of all an enlightened public conscience which shall recognize a moral and ethical side to business matters, a sentiment which shall give honor to those who are willing to bestow some thought and work for the benefit of posterity, for the happiness of their children's children, as well as to those more selfish, whose greatest care is to get money now.

Mahoning, O.

J. W. Pike.

Recent Publications.

History of Botany (1530-1860). By Julius von Sachs. Authorized translation by Henry E. F. Garnsey, revised by Isaac Bayley Balfour. (Oxford: Clarendon Press, 1890; 8vo, pp. xii., 568.)

The present translation of Professor Sachs' work, which appeared in Germany in 1875, is intended to supply the want, long felt by English-speaking students, of a history of botany in English, for, strange to say, there is no English work on the subject in existence. Unlike the older histories of Kurt Sprengel (1818) and Ernst Meyer (1857), which abounded in technical facts, so that, in reality, they were encyclopædias quite as much as histories, the present work attempts to give a bird's-eye view of the science from its origin until the date of the appearance of Darwin's "Origin of Species," which marked the beginning of a new era in botany. The book is divided into three parts, treating respectively of the History of Morphology and Classification, the History of Vegetable Anatomy and the History of Vegetable Physiology. The first and third parts cover the ground since 1530; but vegetable anatomy, a study which requires the use of good microscopes, is of more recent origin, and, according to Sachs, does not go back farther than 1671.

Botany, as a science, did not exist among the ancients, and what passes for botany in the writings of Aristotle, Theophrastus and Pliny is merely a crude description of plants almost buried in a mass of philosophical speculation, and, until comparatively recent times, the history of botany is mainly an account of the struggles of learned men to free themselves from Aristotelian preconceptions and to substitute a knowledge founded on exact observation for vague hypotheses. The first object in science is to obtain a large number of facts; but the ultimate aim, as is strongly and repeatedly urged by Sachs, should be to discover the general laws to be obtained by a comparative study of facts. Throughout the whole of the present work we find brought into strong contrast the observers and accumulators of facts, on the one hand, and the more philosophical reasoners, on the other. In his admiration of the latter class it may, perhaps, be questioned whether Sachs has not, unintentionally, somewhat underrated the former. He apparently regards it a defect in Mohl that, although an observer of the first class, he was disinclined to draw general conclusions from his observations. But a comparison of Mohl with Schleiden, who had no hesitation in laying down general laws from imperfectly understood facts, leaves no doubt as to the superiority of Mohl, a superiority due, as one may think, in some measure, to his disinclination to theorize.

Of the three parts of Sachs' History, that relating to morphology and classification is the least satisfactory, and the one least interesting to the general reader. Contrary to the general impression, Sachs believes that the conception of genera preceded that of species in the writings of earlier botanists, and what he says on this subject certainly has a great deal of force. The place of Linnæus in botany has been much discussed. Just now it is the fashion to say he was much overrated. He was not an experimenter as was Camerarius, who was the first to prove the sexuality of plants, but Linnæus did not claim to have discovered sexuality. But, as Sachs admits,

Linnæus was acute enough to be able to sift the truth from error in the work of his predecessors, and, if he was not entirely free from Aristotelian methods in his reasoning, he was able, as was no other before him, to present a clear and comprehensive system which prepared the way for subsequent classifications. It is hardly necessary to hint that he was not the author of the binomial system, for all attempts to prove the contrary have only resulted in showing that he was certainly the first to advocate and practice such a system. On the whole, recent endeavors to belittle Linnæus have served only to make his superiority the more evident.

The chapters on anatomy and physiology will be found to be much more interesting than those on classification, and, whether one agrees with the author in his estimate of individual botanists or not, they form a most admirable summary of the subjects. The style of the original was clear and forcible and its characters have been well preserved in the excellent translation, which follows the original German, except in a few places where, as the author states in the preface to the translation, changes "could be effected by simply drawing a pen through a few lines."

On closing the book the reader who has followed the course of botany since 1860 cannot fail to remark how great has been the change in the science since that date. The "Origin of Species" certainly has brought about a new epoch in botany. Looking back to 1860 it seems to be but a short time, but there has been a revolution in scientific ideas. One would be glad to have from Sachs, who has himself contributed so much to recent advance in botany, a summary of progress since 1860, and the desire is only intensified as one reads in the author's preface the following lines: "I would desire that whoever reads what I have written on Charles Darwin in the present work should consider that it contains a large infusion of youthful enthusiasm still remaining from the year 1859, when the 'Origin of Species' delivered us from the unlucky dogma of constancy. Darwin's later writings have not inspired me with the like feeling." One would be glad to know exactly which works of Darwin are here meant and why they have failed to inspire the like feeling. Are we to attribute the change of view to the conservatism which naturally increases with age, or are we to conclude that a maturer reflection has convinced Sachs that science has advanced too fast and too far in the direction of Darwinism, and that the pendulum of progress is to oscillate in another direction hereafter?

Correspondence.

Orchids in New Brunswick, New Jersey.

To the Editor of GARDEN AND FOREST:

Sir.—In the gardens of Charles J. Carpender, Esq., of New Brunswick, New Jersey, I recently found a rich display of flowers scattered through the three houses devoted to the culture of Orchids. There were also fine groups of Nepenthes, Anthuriums, Ferns, etc., growing luxuriantly. Among the Anthuriums was a grand form of *A. Andreanum*, bearing flowers of enormous size, some of the largest measuring nine inches in diameter. The Nepenthes, too, were furnished with pitchers of fine form and color, among them being good examples of *N. Amesiana*, *N. Hookeriana*, *N. Dominiana*, etc. Among the Orchids, *Lalia purpurata* made the most prominent display, with its large and bold blossoms, and several excellent varieties were seen, one especially being very distinct, with broad, flat sepals and petals, and a lip of a very rich purple color. The plant bore six spikes, carrying some thirty flowers. Near the roof of the house a number of the beautiful rose-colored *L. majalis* were seen, and, judging from the enormous flowers they bore, this position suited them exactly. One plant had produced two spikes, one with three, the other with two flowers. They were attached to wooden blocks, and when growth is completed they are removed to a cool and dry atmosphere to enable the bulbs to mature thoroughly, and this Mr. Carpender considers the main cause of his success. Among the Cattleyas several fine examples of *C. Skinnerii* were well flowered; also *C. Gaskelliana*, and the old but still popular *C. Mossia*. Many others promise a fine show at a later period, among them being several plants of *C. Dowiana*, well sheathed *C. chrysotoxa* and *C. gigas*, all grown in baskets, and in vigorous condition. Several interesting Cypripediums were also seen in flower, chief among them being two large examples of *C. caudatum*, with its curious tail-like petals. The pretty *C. Lowii* had furnished a strong spike, and a group of *C. Lawrenceanum* were all in fine condition, their dorsal sepals being very broad and large, and in one va-

riety the whole flower was suffused with purple. *C. Domenii*, *C. Sedeni*, *C. callosum*, *C. Warnerii*, and others, added to the display; a plant of *Uropedium Lindenii* was in full bloom, its quaint flowers reminding one of a pouchless Cypripedium, and by its side was *Eulophia pulcherrima*, and, though not a very showy variety, its blossoms were well marked. Some excellent Dendrobiums were hanging at the warmest corner of this house; among them several examples of the white flowering *D. Dearei*, bearing clusters of its butterfly-like blossoms. *D. Bensoniæ* also was well flowered, its white sepals and petals, together with its deep maroon centre, making it very attractive. One plant of *D. Pierardii* had produced scores of its pink and primrose-yellow flowers. *Vanda teres* grew very well in this house, and had produced several fine blooms. They were placed in baskets with moss and a good drainage. *Chysis bractescens* was represented by a plant of large size, bearing a number of its bold, wax-like flowers. Some remarkable specimens of *Peristeria elata* (the Holy Ghost Plant) were in robust health, and dozens of spikes were rapidly pushing for flowers. Some stout spikes of *Odontoglossum vexillarium* were rapidly developing, and will later yield a fine display. In the Odontoglossum house there were a number of the beautiful *O. crispum Alexandra*, carrying well flowered spikes, among them several of the true broad petaled type. Here also *O. Cervantesii* was flowering profusely, one plant carrying some two dozen flowers. Quantities of *O. Rossii* were also well bloomed, together with *O. Pescatorei*, *O. cordatum*, *O. roseum* and many more.

Summit, N. J.

A. Dimmock.

The Rest of Plants.

To the Editor of GARDEN AND FOREST:

Sir.—Referring to your suggestion that I should write something on this subject, I may add to what has already been said (see GARDEN AND FOREST for April 16th, page 195), that practically, as I suppose, all plants have, or are the better for, a rest; but it is hardly conceivable that there is any absolute cessation of activity short of death. In the so-called dormant or resting period chemical and molecular changes advantageous to the plant are, no doubt, going on. When there is a sharp change in the conditions from a fall in temperature or from lack of an adequate supply of water, then the "rest" is more pronounced than is the case where the conditions are more uniform. In equatorial countries, where the climate is nearly uniform throughout the whole year, growth is also continuous. So in the cultivation of evergreen Orchids, or of bulbs which bear their leaves the whole year, it is evident that the "rest" is different in degree, at least, from that which obtains in cases where the leaves die off, and the treatment must be correspondingly different. Generally speaking, plants may be "rested" by submitting them to a lower temperature and by withholding water. In some cases, as with bulbs, tubers of Dahlias, etc., lifting the bulbs and storing them in a dry place to which frost has no access insures as perfect rest as can be had. But that Nature will have her way is shown by the circumstance, that bulbs and tubers (for example, of Potatoes) will sprout in dark cellars in spite of our care.

So far, then, as relates to "directions for resting plants which may be of service to an amateur window-gardener," I should say that he should make himself acquainted with general principles, and, with that knowledge as a basis, with a little zeal and more patience, he will soon learn to apply them successfully, and in so doing get to learn the habits and the natural rest-season of each plant or species. The more nearly we can cultivate our plants as "annuals" the more successful we are likely to be; this, of course, involves a rhythmical alternation of activity and dormancy.

As to books which treat of this subject on this side of the Atlantic, we still turn to Lindley's "Theory of Horticulture" and Thompson's "Gardener's Assistant"; but more recent information is contained in the Introduction to the "Epitome of Gardening" (Black) and in "Plant Life" (Bradbury & Co.).

London.

Maxwell T. Masters.

Notes.

As it is now autumn in the southern hemisphere apples are coming to the English market from Tasmania. The fruit is said to be of excellent quality, and it arrives in first-rate condition.

The death is announced of Sir John Henry Lefroy, a distinguished officer of the English army, Governor of Bermuda from 1872 to 1877, of which he published an account including a catalogue of Bermuda plants with notes on their distribution.

and economic properties and uses. This, under the title of "The Botany of Bermuda," was republished in the *Bulletin of the National Museum of the United States*, No. 25.

Mr. F. H. Vaslett records the fact in *Zoe* that the European Daisy (*Bellis perennis*) has succeeded in establishing itself in one of the glens of Mount Tamalpais, near San Francisco.

Part XVI. of the "Flora of British India," by Sir J. D. Hooker, completing the fifth volume of that great work, has appeared. The Orchids are finished in it.

Several well-rooted young Fig-trees lately arrived at Auburn, California, from Smyrna. The trees, together with some cuttings, were in excellent condition. They came from the Aidin district and are said to be the true Smyrna variety.

A few of the fine dates which come from Africa attached to the stalk on which they grew are still coming in, and among the rarer fruits from the West Indies are a few Star Apples (*Chrysophyllum Cainito*), the red and yellow Mammee Apples (*Mamea Americana*) and Sapodilla Plums (*Sapota Achras*).

Mr. Sereno Watson, the Curator of the Herbarium of Harvard University, and Dr. E. von Regel, Director of the Imperial Botanic Garden at St. Petersburg, were elected foreign members of the Linnean Society at the meeting held on the first day of May. The number of foreign members admitted to the Society is small, and the honor of foreign membership is considered one of the chief marks of consideration a foreigner can receive at the hands of British naturalists.

The flowers of *Magnolia Fraseri*, which have been open for a week near Philadelphia, are of a light canary color, and with almost the same exquisite fragrance which characterizes those of the Swamp Magnolia. A large specimen of this species still stands in Bartram's Garden, and Mr. Joseph Meehan writes of two others in Germantown, one of which is thirty-five feet high, and, although it flowers profusely every year, it never perfects seeds. We have also received from the Meehan Nurseries a flowering branch of a variety of *Viburnum plicatum*, known as Rotundifolium. It seems quite distinct, with reddish twigs and tinted leaves, and comes into flower several days earlier than the typical plant.

Rhododendron Vaseyi, of which a figure and description were published in the first volume of GARDEN AND FOREST, more than sustains its promise as a garden plant. It has flowered profusely this year in the Arnold Arboretum, where it proves perfectly hardy, and where, with the exception of the Rhodora, it is several days earlier than other plants of its class. The bright pink color of the flowers, not very different, although rather paler than that of a good La France Rose, is quite unlike that of any other Azalea. It now seems safe to say that this plant, long overlooked in the valleys of the Blue Ridge, will prove a garden plant of the first class. It may be expected, too, to exert considerable influence in the production of a new early flowered race of Azaleas.

Mr. C. L. Anderson describes in the second number of *Zoe*, the new California monthly, a curious monœcious Willow which he finds in his garden at Santa Cruz, and which, moreover, is not uncommon among the trees of that part of California. He first considered it a form of *Salix lasiandra*, but having found several trees with male and female flowers on the same ament, he reached the conclusion that it is a hybrid between *S. Babylonica* and *S. lasiandra*, the former having been introduced early into California, where there are now many fine, large specimens. The supposed hybrid trees have sometimes a weeping habit, so that they can hardly be distinguished from the genuine Weeping Willow, and in others they closely resemble in habit the California species.

The large flowered form of the Scarlet Hawthorn (*Crataegus coccinea*, var. *mollis*) was a conspicuous feature in the middle of May on the wooded banks of Westchester County. This is the earliest of our native Thorns to flower and this year the plants have been so covered with flowers as to light up the landscape in every direction. This Thorn is not only the earliest of our species to flower here, but it is the largest of the Thorns of the northern states. Trees twenty to thirty feet high are not rare. The flowers are large and handsome. The fruit, which ripens early, is large and brilliantly colored and the ample foliage turns bright before it falls in autumn. The habit of the tree is excellent and it should be cultivated much more frequently than it is. The only drawback to it is in its liability to be attacked by a fungus which sometimes disfigures the foliage and fruit late in the season.

One of the most beautiful and effective plants which have lately flowered in Central Park is the Black Haw (*Viburnum*

brunifolium), a large, tree-like shrub which is one of the native plants of this vicinity, although much more common further south. It was planted long ago, fortunately in large numbers, in the park, where many specimens have now grown to a large size; and this year they were unusually full of their large, flat clusters of white flowers, which, later in the season, will be followed by bright blue-black berries. The Black Haw, as it appears in the park this year, is another example of the great value as ornamental plants of many of our little known native shrubs, among which are to be found the safest and therefore the best material for the decoration of parks and pleasure-grounds in the region where they grow naturally. Our flora contains some of the most beautiful trees and shrubs known to man, but Americans, or those who plant gardens, are only just beginning to realize the fact and to learn that they must depend on the native products of the soil for the best material for their plantations. A desire to imitate what is done in other countries has certainly had some deplorable results in retarding the development of American garden-
ing.

The meeting held in Boston on Saturday last, at the invitation of the Appalachian Mountain Club, to consider the best means of preserving fine scenery and places of historical interest, was attended by persons representing all parts of Massachusetts. Mr. George C. Mann, President of the Club, spoke of the 400 cordial answers to the invitation which had been received, and he mentioned especially the replies of Governor Brackett, Mr. Whittier, Mr. Francis Parkman, Colonel J. W. Higginson and other distinguished citizens. Addresses were made by Mr. Charles Eliot, Mr. J. B. Harrison, Hon. Leverett Saltonstall, Professor Norton and Judge Shurtleff. The chairman, President Sprague, of the State Senate, was authorized to appoint a committee, with power to add to their number and in such ways as may seem advisable to effect the establishment of a Board of Trustees empowered to acquire land and hold for the benefit of the public beautiful or historic spots in any part of the commonwealth. The following persons were appointed on the committee: President Francis A. Walker; Miss Sarah H. Crocker, Miss Marian Talbot and Mr. George Wigglesworth, of Boston; Dr. Henry P. Walcott and Mr. Charles Eliot, of Cambridge; Professor C. S. Sargent, of Brookline; Mr. Henry M. Lovering, of Taunton; Hon. Henry L. Parker, of Worcester; Judge William S. Shurtleff, of Springfield; and Dr. J. F. R. Adams, of Pittsfield. Subscriptions to a working fund may be sent to Mr. George Wigglesworth, 89 State Street, Boston.

The annual meeting of the City Parks Association of Philadelphia was held last week on the spacious grounds of Mr. Justus C. Strawbridge, in Germantown, and a most encouraging occasion it proved, with Colonel McClure in the chair and admirable addresses by Dr. S. Weir Mitchell and Mr. Hampton L. Carson. The purpose of this association, which was organized a few years ago under the name of "The Philadelphia Open Space Association," is to open up small parks and squares in the thickly populated portions of the city, and to secure for public use open spaces on the outskirts of the city's built up area, which otherwise would soon be covered over with buildings. The association under its present name has been organized only two years, but with the active aid of the public-spirited men and women who form its membership the city authorities have located the following small parks: Stenton Park, of about thirteen acres, including the homestead of the Logan family, near Wayne Junction; Weccacoe Square, at the corner of Queen and Cobb Streets, the only spot not built upon in the Third Ward; Bartram's Garden, the ground of the famous botanist of the last century, with its collection of rare trees and shrubs still preserved; Northwood Park, with its picturesque brook and meadow, in the neighborhood of Frankford; Juniata Park, a wooded height overlooking a creek, but immediately adjoining the vast manufactories of the Twenty-fifth Ward; and Riverview Park, giving a view of the Schuylkill from the heights above the Pennsylvania Railroad, near Thirty-second Street. In addition to this public action private beneficence has added to the number of parks by the gift to the Association of the Starr Garden, on St. Mary's Street, by Miss Anna Hallowell; the present to the city of a square of ground, in the southern section, by Mr. Edward C. Knight; and of a tract of about five acres, near the junction of Haines Street with the Chestnut Hill Branch of the Reading Railroad, to be known as Waterside Park, by the heirs of the late Reuben Haines. The public spirit and civic pride of Philadelphia have passed into a proverb, but these qualities have never been more worthily exemplified than in the work of this model organization.

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The Lumber Trade Journals.

IN all the older parts of our country where there are no government lands; the various interests which depend upon our forests and woodlands are chiefly in the hands of individual land owners and of lumbermen and it is important therefore that the persons interested in forestry should come into close relations with these two classes. The lumber trade papers and the recent improvements in their character are on this account worthy of special notice. They show marked gains in breadth of view and in seriousness, and the discussion of trade subjects is more direct, definite and business-like. The assumption that only lumbermen can have practical ideas on forestry subjects has been outgrown, and writers for the leading lumber journals recognize the community of interests which is involved in nationality and civilization, and which binds all the people of our country together. The clear perception of the fact that the functions of forests and their relations to the future timber supply of the country, the permanence of the streams and the fertility of the soil are matters in which all intelligent and patriotic Americans should feel interested, is a distinct advance.

The increased earnestness is the greatest gain. This has been brought about naturally by the operation of the laws of business and by the immense development of the interests represented by these papers, and these processes of expansion and improvement are still going on. Not long ago the writing in lumber journals—there was not much of it indeed—seemed intended to be humorous rather than informing, and the selections appeared to have been made by the office boy when in a hurry to get away to a ballgame, as they often had no relation to the objects of the paper, but merely filled up the space. At present the leading lumber papers are usually pretty well filled with interesting matter. Some of them have valuable special contributions descriptive of the timber resources of various regions of our country, which are evidently based on actual observation.

In some instances the old fashion of “bright” writing, which has no relation to facts, is still followed, but the

method of accurate reporting, which is the basis of all real journalism, is gaining ground. One of the western lumber papers had an editorial article on the late annual meeting of the American Forestry Association at Philadelphia, which contained exactly as many errors as items of statement. The misrepresentation in such cases is not what most deserves attention, but the lack of intellectual seriousness, the slight way in which the writer manifestly thinks of his own work and of the important interests with which he deals.

The editor of a lumber trade paper has a chance to make his place highly influential and useful. This department of American journalism has undeveloped opportunities and capabilities which should make it attractive to young men of ability and education in the lumber business. There is no reason why the best writing of the time on forestry subjects should not be done in the offices of these papers, if such young men equip themselves with adequate knowledge and with the power of comprehensive thought. This last is one of the most important requirements for the people interested in forestry, too. They need to be able to “look before and after,” as Shelley says, to understand relations and tendencies, and to estimate rightly the effect of forces which operate slowly. Our country needs more men who can think of interests beyond the limits of their own farm, town or state. Some men in New England, for example, think the discussion and agitation of forestry subjects unnecessary, because in their neighborhood there is more woodland than there was thirty years ago. We call a worn out field woodland, though it may have but half a dozen specimens of *Pinus rigida* to the acre, and these worried and crippled by cattle past all possibility of useful growth; and though the area of woodland may have increased, there is, in many instances, far less of valuable timber than formerly. A jaunty and superficial optimism is often comfortable for thoughtless people, but no man can treat our national forest-interests adequately who does not understand the possibilities of tragedy which are involved in our methods of mismanagement.

What do the intelligent and public spirited men who are interested in forestry subjects desire? What are their wishes and aims? That the forests and woodlands of the country shall be managed intelligently, so that the greatest benefit, service and profit for all concerned can be obtained from them. What do sensible and practical lumbermen and owners of timber lands desire? Precisely the same things, of course. We are all interested in forestry, as we are in agriculture, and whatever leads to wiser knowledge and better methods advances the general welfare. The lumber people and the forestry people are alike interested in having timber cut off with foresight and calculation, and in having the land so cared for and protected that the timber will grow again, and that it will be perpetually reproduced on all land which is fit for no other crop. What is the good or sense of wanton waste and destruction, however limitless our supply of timber may be supposed to be? Not many years ago a citizen was remonstrating with an army officer when he and his men had killed over thirty buffaloes one afternoon, when only their tongues, and not all of them, could be used. But the officer replied that if the whole army of the United States were constantly employed in killing buffaloes no impression could be made upon their numbers. He is still living, but he will never dine on buffaloes’ tongues again.

Not long ago it was pointed out to a farmer in southwestern Iowa that if the Black Walnut which he had been cutting for firewood for thirty years had been allowed to stand it would now have been worth more than the entire farm would sell for without it. He was surprised, but, after a few moments, said he did not doubt it. “But,” he added, “it is too much trouble to think of anything so far ahead.” Perhaps we cannot reasonably expect the mass and average of our fellow-citizens to learn to act with habitual recognition of laws and forces which operate so slowly

as those which manifest themselves in the relations of forests to the welfare of men and nations, but unless the teachers and leaders of the people are capable of such foresight our proper national destiny is imperiled. The nation which cannot take care of its forests, its streams or its soil is likely to be found wanting in other things when new conditions arise requiring wisdom, forethought and self-control.

We all need to learn. It is not safe to assume that any class of people knows all there is to be known on any subject. When we differ let us express our opinions plainly and directly, and stand up for them man-fashion, and expect other men to do the same. It is good American style to say what we mean and mean what we say. No important subject of our time has yet had adequate discussion in this country. It is of the first importance that forestry subjects should come to be regarded as matters of general public interest and concern; that they shall not be fenced off into a narrow arena for petty contentions between specialists, the forestry people on the one side and lumbermen on the other, while the country remains generally indifferent and absorbed in other affairs. These subjects are so large and vital, and have such relations to our national welfare, that it is reasonable that intelligent and practical men should inform themselves regarding them. They can do this only by acquaintance with the literature of these subjects, and with their systematic presentation and continuous discussion in journals which treat such topics intelligently and earnestly. All thoughtful men will, therefore, wish for the lumber trade journals the greatest possible success.

OUR London correspondent describes in another column an interesting meeting of the Royal Horticultural Society, held on the 13th of May, at which a discussion upon hardy trees and shrubs with showy flowers was the principal feature, considerable collections of the flowers of such plants being shown by the authorities of the Royal Gardens at Kew and by some of the nurserymen who make a specialty of cultivating them. This exhibition and the discussion which it provoked are indications, perhaps, that the English, who still set the fashion to the world in gardening, are at last beginning to realize that they have unduly neglected of late years deciduous trees and shrubs in favor of evergreens, which, as our correspondent points out, have been too much planted in England during the last thirty years. They have their place, and have greatly increased the material available for the use of the modern gardener. It is equally true, however, that modern English gardens have been made monotonous and uninteresting by the excessive use of such plants, which, even in England, do not thrive everywhere, and which in cities and their suburbs seem always out of place because they are never really healthy when brought within the influence of city smoke and dirt. We in America can well rejoice at this change of English feeling, or, to speak more accurately, this return to the ideas of the early part of the century, when deciduous trees and shrubs with handsome flowers were held to be the chief ornament of the garden. We have followed the fashion set in England here and tried to cultivate conifers and broad-leaved evergreens, generally with the most unsatisfactory results. The climate of eastern America is not favorable to plants of this nature; but if deciduous trees and shrubs are to become fashionable again, we have all the natural conditions in our favor, and if we cannot show the world the effects such plants are capable of producing, it will be because our gardeners lack the intelligence to strike out for themselves and make the most of their advantages.

American gardening, as has been said before more than once in these columns, if it ever ceases to follow foreign fashions and attains to a national school of its own, will owe its excellence to a more general use of deciduous plants than now prevails, and to the development of new and better forms of such plants.

It is only a visit to Central Park on a pleasant Saturday afternoon in May, when the lawns are covered with children, that can give the real idea of its immense value to this city. Many of these children dwell in crowded tenement-houses, and the full enjoyment of a breath of fresh air amid rural surroundings must seem to them like a foretaste of heaven. It seems incredible that any one with any interest in New York and in its people, with the memory of such a sight in his mind, can for a moment be willing to see any part of the park alienated from the purposes which primarily make it useful, and devoted to any other use. Central Park is truly a marvelous creation, when it is considered what it was made from, and that it is in the heart of one of the large cities of the world. Its supreme merit lies in the fact that it reproduces Nature as no other great-city park in the world does, with the single exception of Prospect Park, in Brooklyn. As compared with the parks of London, Paris, Berlin or Vienna, Central Park is pure country, where the city-dweller can forget bricks and mortar and revel in the delights of trees and grass, of moss-covered rocks, and meadows dotted with wild flowers. There are prospects in Central Park, like some of those from the foot of the terrace looking across the lake, which are as far removed from all idea of city surroundings and city life as if they looked out upon the banks of some lake a hundred miles away in a remote and wild part of the country; and these views represent all of the country that thousands of children born in this city ever know. Surely every effort to deprive our people of any of the natural beauties of Central Park must be thwarted, whatever effort it may cost the intelligent men and women who have at heart the best interests of the city.

The park is already too small for the demands made on it by the public. In a few years it will be so crowded on holidays that its usefulness will be seriously interfered with. No part of it, therefore, should be given up for any purpose whatever which in any way will interfere with its real mission, which is to bring to the people of this city a little of the country and its civilizing and health-giving influences.

A Stone Bridge in Wales.

AS an interesting contrast to the stone bridge at Topsfield, Massachusetts, which we illustrated a short time ago, we give on page 275 a picture of a similar bridge in Wales. The picture speaks for itself with regard to the beauty that such bridges have, no matter what the character of their surroundings may be. In the former instance we saw a quiet, pretty stretch of river, the banks overhung by low trees and shrubs, and no buildings in sight. Here the bridge forms a feature in a village street, yet it is just as appropriate and just as charming. Of course were these simple but solid stone houses replaced by wooden ones of the usual American type there would be less harmony and less dignity in the picture. But, at least in our older villages, the wooden houses stand beneath great Elms and Maples, which give beauty of a different kind; and in a street thus composed a stone bridge would be an equally fortunate detail. The thick growth of Ivy that covers the sides of the Welsh structure could not everywhere be reproduced in our colder, drier climate; but we have enough vines of our own to clothe bridge or river wall most beautifully, during the summer season at least. And even in their winter nakedness they would still be attractive, while the cheap bridge of wood or iron is hideous when naked, and only tolerable even when draped with green.

The Trees of Persia.

NO country, within the same limits, presents such vivid contrasts of scenery and vegetation as Persia. There are wide districts which have all the characteristics of the Desert of Sahara, while only a day's ride from there one climbs stupendous mountain ranges or plunges into the depths of forests where the sun is hardly seen and the music of the cataract reverberates through a primeval solitude. The centre and south of Persia is a vast arid table-land from 3,000 to 4,000 feet above the sea. Here and there it is intersected by mountain chains many thousand feet high, covered with perpetual snow. The melting of this snow furnishes the water which,

by laborious irrigation, causes vegetation to prosper around the cities or in artificial oases. Naturally, there are no forests on this plateau, and the large province of Khorassan, some 60,000 square miles in extent, is chiefly a salt-sand desert, having water only at long intervals. This district is supposed to have been the bed of a sea like the Caspian, which gradually evaporated, as the Caspian is now doing.

On this plateau Poplars, Mulberries, Walnut-trees and almost every variety of fruit-trees can be made to flourish by irrigation; but evergreens, like the Pine, do not seem to take kindly to the soil or the climate. The Peach is indigenous to this region; the Fig grows well, although inferior to that of Asia Minor. The Quince of Ispahan is famous; its flavor and fragrance are unsurpassed. The Pomegranate is also a favorite tree of the Persian plateau. But all these trees are there dependent on irrigation. Stop that, and the spirit of the desert, in a very short time, resumes its sway.

But the most remarkable vegetable phenomenon of the Persian plateau is the Chevar or Plane-tree, called with us the Buttonwood-tree or Sycamore. Every Persian garden has some of these trees. They are planted in rows near together and trimmed high up so as to produce a lofty shaft. A double purpose is served by this process—shaded avenues are obtained and timbers for roofing the dwellings of adobe. The scarcity of timber in Persia renders this a most important object. Plane-trees and Poplars are one of the most valuable sources of revenue to a Persian proprietor. The avenue of these trees extending from Teheran to the villages of the Shimrân, where the wealthy resort in the warm season, a distance of some eight miles, form an appanage of the chief wife of the Shah, who makes quite a revenue from the annual product of this timber. But the Plane-tree in this form is the result of cultivation. It is in its natural state, as it grows without the intervention of man, that it chiefly concerns us here. The Sycamore is reputed by tradition to have been the tree cursed by the Saviour for its barrenness. In the remotest times legends clustered about it, especially among the Persians. Alexander the Great, on his march to Hyrcania, is said to have come across a pair of Plane-trees in the north of Persia—one male, the other female—which, in a mysterious conversation, foretold his destiny and his doom. Marco Polo has much to say of this tree in speaking of Persia; and it is very remarkable that he generally writes of that country as the *Arbre See* and the *Arbre Sol*, thereby indicating what a prominent feature of the Persian landscape and vegetation the Plane-tree was in those days, in so much that it gave a name to the country.

The Platanus is indeed a most eccentric and extraordinary tree, as one sees it in Persia. It enjoys water courses and shady valleys, and it grows in the desert far from water with equal satisfaction apparently and with equal grandeur. It is by far the noblest tree of central and western Asia in its form and dimensions. The Plane-tree under which Godfrey of Bouillon encamped by the Bosphorus is still standing, a most venerable and gigantic patriarch. Not many years ago a similar tree was standing in Asia Minor which was reputed to be the tree which Xerxes decorated on his way to Greece.

The market-place in the Persian villages, where the streams rush down from the mountains, are always shaded by one or more vast Chevars, under which the peasant rests at noon-day, the cobbler plies his awl, the itinerant musician or physician soothes the rustic mind or body, and the children and the dogs romp and sleep in idle groups. The mosque courtyards in the cities are ever canopied by the spreading boughs of the Plane-tree, and one almost feels that this is indeed a tree which seeks and thrives especially in the society of man, and that abundant water is one of the essentials of its development.

But go forth from the habitations of man, and far from the springs of water, where the soil is yellow sand or pumice-stone, ejected ages ago from the vast crater of Demavend, where there is no herbage, or, at most, only the cynical Thistle; where even birds are few, and these chiefly the eagle and the vulture soaring far up in the blue dome that rains heat over the wastes that quiver with mirage, and which is swept over by whirling columns of dust, and you find the Chevar flourishing there.

I remember a most noble old Plane-tree at Gelandevék, standing by a tank where the Shah's pavilion is pitched when he hunts in that district. Fruit-trees and Melon-fields and rivulets, and a village hidden in foliage, were all about us, and the old tree, still green in its old age, was evidently in congenial company. But from the door of my tent I could look on the yellow and arid side of a great hill, on which the sun pitilessly rained heat. Near the top of the slope stood a large and solitary Plane-tree, the only green thing on the hill. Its

leaves were as abundant and fresh as those of its rival, whose roots rested among the "rivers of waters."

Turning from the central plateau to the south we find the chief feature in the arboreal vegetation of Persia to be the Date Palm, which grows in the neighborhood of the Persian Gulf in such abundance that dates form one of the most important articles of export from the country. On the other hand, in the south-west, in the region bordering on Turkey, extensive forests of dwarf Oak are found, the only examples of the Oak in Persia.

If we turn north again from the central waste lands of Persia we find ourselves confronted by the tremendous ranges of the Elborz, practically a continuation of the Hindoo Kush, extending from Turkistan to Armenia. In Persia it has an average elevation of 9,000 feet, rising to 13,000 feet between Teheran and the Caspian, while the peak of Demavend, forty miles from the capital, is no less than 21,000 feet high, the loftiest mountain between the Himalayas and the Andes. South of the Elborz range stretches the great arid table-land. But when one reaches the top of the ridge he enters with great suddenness, and without warning, upon an altogether different scene. The north side of the mountains faces the Caspian Sea, and condenses the moisture deposited by the clouds driven by the breezes of an inland sea 800 miles long. Here one finds "a land of streams." Everywhere cascades leap down the mountain sides. The roads are often by the side of deep and turbid rivers or carried over them by stone bridges of the most massive character. A piercing wind rushes through the gorges, so violent at some points as to blow men, and even mules, into the rivers. What is yet more remarkable, almost immediately after beginning the northern descent, the traveler enters the gloom of the densest forests in the world. The sun umbrella is laid aside, and whereas the roads were thick with fine white dust, they are now often muddy and traversed by chattering brooks.

The forests, league after league, are Walnut, and here and there Chestnut. The vastness and density of these Walnut forests is extraordinary. They reach almost from the ridge to the sea, a distance of seventy or eighty miles, and east and west over 200 miles, along the rich alluvial strip which borders the Caspian.

In the heart of these forests the mouldering ruins of old castles and towns are still to be seen of which the very name is forgotten, and the tiger, the panther, the wild boar and the wolf roam through the underwood unmolested. Curious wandering tribes also dwell there, doubtless descendants of the legendary White Dios encountered and conquered by Rustem in the glimmering dawn of history.

The glades in these forests are of magical beauty; one may easily imagine himself to be in the realms of the Fairy Queen when at noonday he comes to one of these delicious openings and lunches on a rich green sward, where the air is musical with streams and an abattis of huge massy fallen trunks seems to protect one from the dark ranks of the surrounding forests. One of the most singular features of these forests is the frequent appearance of the Pomegranate growing wild. Its bright green, glossy leaf contrasts vividly with the darker foliage around it, while the exquisite orange-scarlet of the blossoms shines in the emerald gloom like sparks of flame. At intervals, grandly picturesque forests of Olive are seen, chiefly on the river banks; the Elm and the Box also grow there in considerable abundance, and the Poplar is common. But the chief feature of the great forests of northern Persia is, after all, the Walnut. Deciduous trees alone compose that wilderness of woods. On the plain near the Caspian, however, Cypress are sometimes seen, chiefly near the towns, evidently the result of cultivation. It is worth remarking that the northern side of the Elborz reeks with malaria, and dangerous fever lurks in the jungle along the Caspian, while the arid central plateau of Persia is one of the healthiest regions on the globe.

New York.

S. G. W. Benjamin.

The Water Supply of Southern California.

CALIFORNIANS are now discussing the forests, swamp-lands and possible reservoirs of the southern Sierras. A very interesting interview was recently held with Mr. S. C. Lillis, of Kern County, the manager of the famous Laguna de Taché ranch. He holds that the proper irrigation system for the San Joaquin Valley is based upon two things—the preservation of the forests and the utilization of the natural reservoir sites. He says that many sheep men have been permitted to obtain rights to the natural pastures of the high Sierras under an incorrect interpretation of the Swamp-land Act. These tracts are situated above the five-thousand-foot level, and are unfit

for agriculture. They are now cut and pastured so closely as to destroy many springs and streams. All the lands above five thousand feet of altitude should be kept for timber and mining, withdrawn from sale and protected.

Mr. Lillis says that for six years he has traveled over the mountains of three counties, a territory as large as Massachusetts, and has seldom been able to find trees of less than twenty years' growth. This shows that the sheep have destroyed all the young timber, and that it has not been permitted to grow. He found that in the high Kern districts, from 8,000 to 12,000 feet above the sea, one-third of the standing timber was dead. Last July and August he was never out of sight of eight or ten forest-fires, and sometimes counted more than twenty. He continues:

"I have asked sheep men for the reasons for so many fires, and they have answered that they did not want their sheep obstructed in their movements by timber and brush, and that they proposed to burn it off. The needles or leaves of the Pine-trees on the Kern and Kings Rivers are removed from the roots of the trees by the sheep, and they are exposed to the frosts of winter and the heat of summer. The frequency of the fires destroys the outer bark, and finally the tree dies. Then the fires catch in the resin of other trees and burn them, leaving the mountains as bare as a desert."

The old settlers in the Sierra region say that an enormous amount of water can be easily and cheaply impounded there. The present system is to construct expensive dams in the cañons near the valley. The proper places for reservoirs are on the high levels in chains of small lakes, and "flats" where the outlet can be raised at a slight expense. There are said to be hundreds of places at the heads of the Sierra rivers that are adapted for water storage. About these natural and artificial lakes the native timber should be allowed to grow, and the sheep pasturage and annual burning of the forest should be prevented. This is the most simple, effective and least costly system that has been proposed, and all the old mountaineers favor it.

Niles, Cal.

Charles H. Shinn.

New or Little Known Plants.

Phoenix Roebelenii.*

THIS new and distinctly marked species of *Phoenix* was introduced into England about a year ago by M. Roebelen, of Singapore, who forwarded plants of it to a London auctioneer, from whom they were all purchased by Messrs. F. Sander & Co., of St. Albans, except the plant here figured, which is in the Kew collection. It is by far the smallest of all the many kinds of *Phoenix* known, and is also exceptional in the form of its stem and in the elegance and soft texture of its bright green leaves. According to M. Roebelen it is a native of the Laos States, Siam. "It grows in great abundance along the rocky banks of the majestic river Mekong, as far north as twenty-two degrees latitude, and where the temperature descends to forty-one degrees Fahrenheit in the months of December and January. Although I looked very eagerly for seeds and flowers, I could discover none, but was told by the natives that monkeys and wildcats are very fond of the small berries, and carry them to their hiding places, where I really could discover thousands of seedlings. The stems of this exceedingly graceful pigmy Palm never attain to more than about two feet in height, and the plant generally grows in large clumps. In the Singapore Botanic Garden there exists a small example of a Palm without a stem, and resembling my Palm very much in color and shape of the leaves, labeled *Phoenix farinosa*, and of unknown origin. Whether it is the same, or a nearly allied species, I cannot say, but doubt it very much, as *P. Roebelenii* was unknown to the natives, but was much admired by those Laos living further south of the town of Luang Phrabang."

In the Kew herbarium there is a specimen of a *Phoenix* collected in 1848 by Sir Joseph Hooker in Sikkim at an altitude of 4,000 feet, and which is very similar to *P. Roebelenii* in every character except in its being stemless although in flower.

The plant here figured (see page 273) has two stems, the longer of which is sixteen inches in length by one and a half

inches in diameter. The leaves are a foot long, and the pinnæ, which are not quite regular in their arrangement along the rachis, are from five to seven inches long, shining dark green, soft in texture and curved, and not at all spinous at the tips.

Beccari in his recently published monograph of the genus *Phoenix* refers *P. Roebelenii* to *P. humilis*, var. *Lourieri*, which he describes as having very glaucescent fronds from two and a half to three and a half feet in length. He also includes under *P. humilis* such widely different plants as *P. pedunculata*, *P. Hanceana* and *P. pusilla*. However much the needs of botany may justify this lumping arrangement, it is worse than useless for horticulture. Indeed, I believe that if Professor Beccari could see living plants of *P. Roebelenii* he would almost certainly feel compelled to alter his views with respect to its botanical position.

At Kew we have all the cultivated species and most marked varieties of *Phoenix* represented by living plants, but we have nothing that comes anywhere near to *P. Roebelenii*.

From its habit of pushing up suckers freely, this Palm is likely to become soon plentiful in gardens; its abundance in a wild state, as described by Roebelen, is also likely to be turned to account by collectors.

It is one of the prettiest of the many Palms cultivated at Kew, deserving to be placed in the same category with *Cocos Weddelliana* and *Geonoma gracilis*, so useful when small as decorative plants.

Kew.

W. Watson.

Foreign Correspondence.

London Letter.

THE meeting of the Royal Horticultural Society on May 13th was a most successful one, the exhibits being numerous and exceptionally interesting. The authorities had invited exhibitors to send specimens of such flowering trees and shrubs as bloom in the open air in England at this time, and the occasion was in fact an "Arbor Day." The vast number of beautiful hardy spring flowering shrubs now in cultivation and made available for every one by the energy of nurserymen was abundantly set forth. Many gardeners were surprised to find how much richer the shrubbery and park might be made by a liberal use of hosts of beautiful flowering plants which till now were unknown to them.

There are evidences of a revival of interest in this department of gardening. Evergreens, and especially conifers, have perhaps been over-planted in the making of English gardens, the effect being much heavier and more monotonous than is desirable in a garden—an effect more properly associated with the churchyard and cemetery. The niggardliness with which good flowering hardy trees and shrubs have been and are even now employed in the composition of the out-door garden was commented upon at the meeting by Mr. W. Goldring, who had been invited by the Society to read a paper on the subject of "Spring Flowering Trees and Shrubs." He recommended gardeners and others interested to pay frequent visits to such collections as that at Kew and to the nurseries where these plants are specially grown, and to note for themselves the plants which might be employed for effect, as well as what to avoid. That such a course was desirable was proved by the plants exhibited at the meeting. Kew alone sent flowering branches of over 180 species, whilst from Messrs. Veitch and G. Paul there were collections of beautiful and interesting plants. Amongst those sent from Kew the following were the most attractive:

Amelanchier Asiatica, *A. Botryapium*, *A. Canadensis*, *A. vulgaris*, *Azalea amæna* (hardy in the neighborhood of London), *Berberis Darwinii*, *B. empetrifolia*, *B. stenophylla*, *Prunus avium* varieties, *P. chrysocarpa*, *P. oxycarpa*, *P. Mahaleb* varieties, *P. pumila*, *Cercis Siliquastrum*, *Choisya ternata*, *Cotoneaster horizontalis*; *Cratægus* of many kinds; *Cytisus albus*, now magnificent at Kew; *C. scoparius*, var. *Andreanus*, *Exochorda grandiflora*, *Genista Hispanica*, *Kalmia glauca*, a delightful little plant with rosy red clusters of flowers; *Ledum palustre* and *L. latifolium*, both ornamental and free flowering; *Leiophyllum buxifolium*, the Sand Myrtle of New Jersey; *Magnolias* of sorts; *Olearia stellulata*, a delightful little shrub with small leaves and clusters of white Aster-like flowers; *Piptanthus Nepalensis*, the Himalayan Laburnum; *Prunus depressa*, *P. pumila*, *P. triloba*, *Pyrus Maulei*, varieties; *P. Ringo*,

*O'Brien in *Gardeners' Chronicle*, 1889, vi., 475.—Roebelen, idem, 758.—Beccari in *Malesia*, iii., 382.

P. Sorbus hybrida, *P. spectabilis*, one of the best of ornamental flowered Pears; *Rhododendron Kewense*, *R. glaucum*; Ribes of sorts; *Rubus deliciosus* and *R. spectabilis*, both represented by large shrubs on the lawns at Kew, and at present thickly laden with large pure white flowers like single Roses; Lilacs of

keel of the flowers and the rich velvety maroon of the wings are most effective. The plant cannot fail to win universal admiration. It is as easy to cultivate as the type, and it flowers when only a foot high. At present it is grafted on stocks of Laburnum, but at Kew it is successfully worked on the com-



Fig. 40.—Phoenix Roebelenii.—See page 272.

many varieties; Vacciniums, *Viburnum cotinifolium* and *V. plicatum*.

Unquestionably, the most interesting and attractive plant exhibited was the new *Genista Andreana* of Continental gardens, the correct name of which is, however, *Cytisus scoparius*, var. *Andreanus*. It is simply a color variety of our native Yellow Broom or "Planta Genista." The colored drawing of it, which was published in the *Revue Horticole* last year, does not do the plant justice. The bright yellow of the standard and

mon Broom. Another name by which this new variety is known is *Genista bicolor*. It was distributed last spring from the nursery of Croux & Fils, near Paris.

Amongst the plants exhibited by the Messrs. Veitch were the rosy flowered *Ledum buxifolium*, *Cydonia Japonica*, var. *Moerloosii*, remarkable for the rich, clear red color of its flowers; *Enkianthus campanulatus*, a new introduction from Japan, not unlike *Andromeda Japonica*, but with flowers bell-shaped, rose colored and conspicuously veined, and *Cytisus scoparius*

Andreanus. The same firm also exhibited *Picea excelsa mutabilis*, remarkable for the bright yellow of its pendent young growth, and *Juniperus Canadensis aurea*, the nut-like buds colored yellow. Mr. Paul showed the white flowered variety of *Cydonia Japonica*, *Pieris (Andromeda) formosa*, a pretty flowered shrub, with panicles of white Lily-of-the-Valley-like flowers; *Prunus Sieboldii*, one of the prettiest of spring-flowering small trees, the rich crimson of the buds and rosy white of the expanded flowers being most ornamental. At Kew this plant, when in flower, is greatly admired; the European *Daphne Cneorum*, a gem amongst Daphnes, most useful for beds or as a marginal plant to borders; it is compact in habit, and produces pretty little umbels of rosy red flowers, not unlike those of a Pimelia, on the ends of the branches.

A garden tastefully planted with the best of the trees and shrubs shown at this meeting would be a perfect paradise in May.

Other plants shown at the meeting were a grand collection of *Pæonia Moutan*, from Messrs. Kelway & Son. Notable amongst them were *Fascinatus*, an enormous flower, colored pale lavender, splashed at the base of the petals with purple; *M. S. Low*, large, rich satin rose; *Beatrice*, a single flowered variety, eight inches across the cup, pure white with yellow stamens and a purple stigma. This is the most beautiful of all singled flowered Moutans. *Caroline d'Italie* is another grand variety, the flowers being large and cream colored, flushed with rose.

Calla Elliottiana is a very handsome yellow flowered variety or species near to *C. hastata* or *C. maculata*, the flower being almost as large as that of *C. Æthiopica*, but colored bright canary-yellow. It is said to have come amongst some tubers of various kinds of Calla imported from the Cape. Seedlings of it have been raised, but they have not yet flowered. This plant shared with the *Cytisus* the place of honor amongst the new plants shown. If it proves as easy to cultivate and as prolific in flowers as the old Nile Lily it will be of immense value as a decorative plant.

Amongst the Orchids the most interesting plants were *Odontoglossum crispum virginale*, with flowers four inches across and pure white save a tinge of pale yellow on the lip; *Cattleya Warocqueana*, a variety of *C. Warneri*; *Dendrobium Galliceanum*, a pale-lipped, loose-flowered variety of *D. thyrsiflorum* and *Disa tripetaloides*. This last is now flowering at Kew. It has the habit of *D. racemosa*, but is smaller in stature, and the flowers are white, spotted with purple; the spike is fifteen inches high and bears nine flowers. It is an interesting and pretty little *Disa*, and whilst falling a long way behind *D. grandiflora* and *D. racemosa* as a decorative plant it is nevertheless worth a place amongst cool-house Orchids. Apparently it is as easy to manage as the other two.

Cypripedium caudatum is variable both in the size and color of its flowers. The finest I have seen came this week from the Glasnevin Botanic Gardens. The length of the tails was thirty-five inches, of each sepal seven inches and of the pouch three inches, the width of the latter being nearly one and one-half inches. The colors, too, were much superior to what one commonly sees in this species.

Catasetum Bungerothii, var. *pileatum*. A figure of this grand *Catasetum* recently published in Sander's *Reichenbachia*, is accompanied by some observations to the effect that the name *Bungerothii*, given to this plant by Mr. N. G. Brown in 1886, must be superseded by that of *C. pileatum*, which Reichenbach had applied to the same plant some years before. I believe there is every reason for assuming that Reichenbach did do this, in fact he told me himself soon after Mr. Brown's description of *C. Bungerothii* was published that he had already named the same plant.

Kew.

W. Watson.

Cultural Department.

Notes on American Plants.

THE first to bloom of our Butterfly Tulips is the little *Calochortus caruleus* from California. It grows only about six inches high, bearing in not very long succession several white flowers with a purplish centre, three-quarters of an inch wide, with hairy bristles inside. It is quite pretty, but the flower stems are too short for cutting. Only two or three days later comes *C. Benthani*, a plant of about the same size with bright yellow flowers, a fitting companion to the first. Our plants of both were protected from the frost by a covering of leaves.

Sedum ternatum, one of the Stone Crops, is valuable in parts of the rockery. It likes shade, yet in a light soil it will thrive in open sunlight. It grows about as high as *Phlox subulata*, and like it forms dense beds so thick that nothing else can live with it. Its dense, light green foliage is pretty, and when the

small white flowers appear, which are borne on three-spiked cymes, with the spikes almost horizontal and the flowers on the upper side, the beds are quite showy.

Many persons who are familiar with the common Chickweed (*Stellaria media*), which is a noxious weed in many gardens, may hardly believe that its near relative, the Great Chickweed, *S. pubera*, can have any value as a garden plant, yet for a shady situation at its time of blooming there are few prettier plants. It forms thick clumps a foot high and more than a foot wide. All over these clumps, as thickly set as can be, are the pretty white flowers, half an inch wide, sprinkled with their reddish brown stamens. It is not inclined to spread with us, at least like *S. media*, but seems to require no special care when once established.

The Wild Hyacinth (*Camassia Fraseri*) comes from a bulbous root with long, grass-like leaves, and bearing a long, naked stem with a spike of pale blue flowers at the summit. The flowers are more than half an inch wide and the spike three inches long by nearly an inch thick. The plant is perfectly hardy, easy of culture and well worth growing.

Iris verna, now in bloom, a little later than *I. cristata*, has pretty blue and yellow flowers, but with us it lacks the bright fresh green foliage which seems as necessary as the flowers for an Iris. This may come on later, but at this season, just as the flowers open, it makes a shabby appearance by the side of a bed of *I. cristata*, planted at the same time.

Allium madidum, from the Pacific coast, grows only about six inches high and bears a small, close umbel of pretty light pink flowers. It needs protection in winter.

The Greek Valerian, *Polemonium reptans*, is a pretty plant growing over a foot high in cultivation, with an abundance of light blue flowers half an inch wide. It is easy of culture and thrives in either sun or shade.

Saxifraga Mertensiana is a small species from Oregon, six to eight inches high, with a low cyme of small white flowers a quarter of an inch wide. The little round, scalloped leaf is its principal feature of interest. These are nearly an inch wide, thick, and lie close to the ground. Our plants were protected with a thin covering of leaves last winter. Whether this would be necessary in any ordinary season or not we have yet to learn.

Smilacina stellata, one of the False Solomon's Seals, is a plant of the Lily family, not uncommon on moist banks, with short panicles of pretty white flowers and rich light green leaves. It is also a pretty plant when in fruit, and might be useful in bouquets at both the flowering and fruiting season. It likes moist, gravelly soil and should be planted in the shade unless such a situation can be given it.

The Arrow-leaved Violet (*V. sagittata*) is not generally so large a plant as *V. pedata* or Bird's-foot Violet, but it grows with it in similar situations and is a pretty species. The blue flowers have a purplish tinge which is not usually seen in the common *V. cuculata*. It likes a fine, loamy soil.

Southwick, Mass.

F. H. Horsford.

Notes on Shrubs.

IT is not an uncommon fault with the accounts of new flowering or fruiting plants which dealers offer to the public, that the descriptions are so rose-colored and alluring as to lead the unsuspecting buyer to make many an expensive purchase which he is almost certain to regret when he discovers that his new acquisition is after all no better than some old kind which he already possessed. Such experiences finally lead people to become distrustful of all the laudatory descriptions in trade catalogues. *Rhododendron (Azalea) Vaseyi* (figured in GARDEN AND FOREST, vol. i, p. 377), from North Carolina, has, during the last year or two, received a good share of praise from all who have tried it, and in this case, at least, everything said seems to be well deserved. Without any artificial protection, and exposed to the sun and to all winds, it has not been injured in the slightest degree at the Arnold Arboretum. It has withstood the test of a variety of winters, and in vigor and hardiness has proved itself fully the equal of its more northern congeners. With the exception of a few unsatisfactory and half-hardy precocious flowering foreign *Rhododendrons* whose flower-buds rarely survive our winters, and of our native *Rhodora*, *R. Vaseyi* is the earliest of the genus to bloom. In an unsheltered situation the first flowers opened about May 15th (three days earlier in 1889) and the finest development of efflorescence was reached within a week. The interval between the opening of the first and fading of the last flowers in any individual plant is ordinarily about two weeks, but sometimes several days longer. At fullest bloom the plants are quite destitute of foliage, but the large, thin leaves appear as the pretty pink corollas begin to fall. Seed is freely

produced on plants in northern gardens, and young seedlings, when well started, make a vigorous and even rapid growth.

The *Rhodora* may bloom a few days earlier than *R. Vaseyi*, and it lasts for about the same length of time. Although normally rosy purple, the color of the flowers on some plants is much paler and even occasionally almost white, a circumstance which has not yet received much attention from propagators. Except when in flower the *Rhodora* cannot be called an ornamental shrub, but it grows well in the partial shade of other shrubs or of trees in any good garden soil, and is not so difficult to transplant as its rarity in cultivation might indicate. When the full grown plants are collected in their native habitat they should be lifted in clumps with as much of the adhering soil as possible. When such care is taken the plants will continue to grow without interruption even when transferred to a much drier soil than that to which they had been accustomed.

Few people seem to know that there is a native species of Laurel which in cultivation blossoms with the *Rhodora*, but continues in bloom somewhat later. This is the so-called Pale Laurel (*Kalmia glauca*), whose first flowers expand three weeks before those of the Sheep Laurel (*K. angustifolia*) or the Mountain Laurel (*K. latifolia*) when growing side by side. It is a straggling little plant from one to two feet high, with small narrow leaves, which are shining dark green above and

grant, pinkish red flowers. In unsheltered spots these appear about the first of May, reaching fullest development and abundance in about two weeks, after which they gradually diminish in number, although good sprays of blossom may be collected up to the first week in June. Again, in July and August or later, a second, though very scattering, crop of flowers is produced among the evergreen foliage. Though sometimes subject to injury in winter, these plants well repay the slight protection necessary to secure an abundance of bloom.

Daphne Genkwa, a Japanese species, has an entirely different aspect from *D. Cneorum* when in bloom. The lilac-blue tubular flowers appear in little clusters along the branches, which are entirely free from leaves during the first ten days of blossoming. The flowers are sometimes described as fragrant, but in specimens at the Arboretum the odor is very faint and delicate when compared with that of *D. Cneorum*. Each year's experience shows that this Japanese species is quite as hardy as *D. Cneorum*, but both are of slow growth. Although the flowers of these *Daphnes* are showy and fragrant, they seem to be rarely visited by insects, and I have never known the plants about Boston to bear fruit. Two other species, however, *D. Mezereum* and *D. alpina*, of European origin, ripen seed in considerable abundance.

Arnold Arboretum.

J. G. Jack.



A Stone Bridge in Wales.—See page 270.

white beneath. The flowers are about half an inch broad and usually lilac-purple in color, but, like the *Rhodora*, the color of the corollas of some plants is found to vary, and be either darker or much lighter than the type.

The Sand Myrtle (*Leiophyllum buxifolium*) is a pretty, diminutive, dark evergreen shrub, also of the Heath family, which only grows from six inches to a foot, or a little more, in height. At Boston it comes into full bloom about the third week in May. The flowers are borne in terminal umbel-like clusters, and are usually so abundant as to completely cover the plant. The unopened buds are pinkish, the flowers very small and white, but the red anthers give them all a pink effect. The white flowers of the Labrador Tea (*Ledum latifolium*) open a few days after those of the Sand Myrtle, and although appearing at a time when white flowers are abundant, they possess a peculiar charm and individuality which is so characteristic of almost every flower in the *Ericaceae*. The Sand Myrtle is a native of the sandy Pine-barren districts in New Jersey and other more southern localities, while the Labrador Tea inhabits regions much further north; but once well established, both thrive in Massachusetts when given the same conditions as to *Rhododendrons*.

Wherever *Daphne Cneorum* becomes known it is admired and appreciated for its compact little clusters of strongly fra-

Originating New Peas.

IT was long thought that natural or insect cross-fertilization of the Pea was practically impossible, but Mr. Laxton, who is known as the originator of some fifty varieties, now thinks that minute insects which appear to feed on the pollen before the flower opens do, in many cases, carry it from flower to flower. The presence of "rogues" or irregular plants is sometimes due to this agency. Great improvements have been made in Peas in point of earliness, size, productiveness, quality and dwarfness of growth. But for various reasons there is a constant tendency to revert to the old form and lose the advantages gained. This makes the continuous production of new varieties necessary in order to counteract this retrograde tendency. How new forms are originated by cross-fertilization was explained by Mr. Laxton at the famous vegetable conference held at Chiswick last autumn in the following passage taken from the report in the journal of the Royal Horticultural Society:

"Natural fertilization usually takes place in the flower of the Pea before expansion, and, therefore, in order to secure a successful cross, the operator must let his work precede this, and it will be necessary to operate two or three days prior to the opening of the flower, and when the incipient blossom is

about one-third its mature size. This is done by carefully slitting up with a scissors' point the front of the keel petal and removing the anthers before the pollen is shed, for should this have taken place in the slightest degree it will be well to abandon the operation and recommence on another flower. The foreign pollen of the desired variety can then be applied through the opening made in the keel of the flower to be fertilized, either from a camel's-hair pencil or by direct application of the ripened pollen-bearing anthers to the upper edge of the carpel. This is best accomplished by an easily acquired movement of the thumb and finger of the right hand holding the pollen-bearing flower, the keel of which, with its point inserted in the opening made in that of the flower to be operated upon, may be drawn back over the anthers, and the pollen will be delivered by a jerk or spring into the desired position. I rarely use a camel's-hair pencil in cross-fertilization, as it brings considerable risk of introducing other pollen or undesirable foreign matter in combination with the pollen to be used. After the operation has been performed, it will be desirable to pinch out the crown and all the flowers and pods on the plant except those cross-fertilized. If in conducting the operation care has been taken not to injure the organs of fructification, and these are in ripe condition, and sufficient pollen has been applied, the pod, if the weather be not too wet or moist, will probably set, and in due course ripen its complement of seeds.

"By means, however, of cross-fertilization alone, and unless it be followed by careful and continued selection, the labors of the cross-breeder, instead of benefiting the gardener, may lead to utter confusion, because, as I have previously stated, the Pea, under ordinary conditions, is much given to sporting and reversion, for when two dissimilar old or fixed varieties have been cross-fertilized, three or four generations at least must, under the most favorable circumstances, elapse before the progeny will become fixed or settled; and from one such cross I have no doubt that, by sowing every individual Pea produced during the three or four generations, hundreds of different varieties may be obtained; but, as might be expected, I have found that where the two varieties desired to be intercrossed are unfixed, confusion will be confounded, and the variations continue through many generations, the number at length being utterly incalculable. We must, therefore, still largely look to selection as the final means of obtaining permanent improvements in the Pea, and I fear the results of the recent work of Pea-crossers can hardly be fully appreciated for some years to come, during which their labors must be carefully followed by those of the seed-grower."

Notes on Vegetables.

TO-DAY (May 17th) we saw the first snap beans in Raleigh. They were of the Mohawk variety, and while the Mohawk is not so early as some other and better beans, if both have warm weather to grow in, yet the Mohawk makes its appearance first because it is better able to withstand the unfavorable weather and light frosts we have in April. So the market-growers find they cannot dispense with it. The earliest Valentines are close behind, but a difference of a few days or a week at this season of the year in a crop so easily grown as Bush Beans means all the difference between profit and loss on the crop.

If all the claims of the seedsmen in regard to new Tomatoes were true we ought to have a variety by this time which we could ripen here early in May, while the fact is that with every convenience for forwarding the crop the first week in June is as early as any can be had. There has been little or no advance in the earliness of Tomatoes in the past twenty-five years, and it may be regarded as settled that in the matter of earliness we have reached the limit. Much improvement can probably yet be made in tomatoes in the way of combining size and solidity with smoothness and earliness. In some of the recent extra early sorts there has been a retrogression in this particular, and the growers have sacrificed vigor of plant for earliness. Dwarf Champion has plenty of vigor though of compact growth. With us it has always been among the earliest, but it lacks quality for the family garden and is better fitted for shipping on account of its tough skin. We have forty varieties now fruiting.

Henderson's Succession Cabbage promises to be a very close successor to the Early Summer, and being of larger size will come in at a very good season for a summer Cabbage. But it must prove good indeed if it supersedes Fottler's Improved Brunswick in this. What we want here in the south is a Cabbage that can be safely carried through late summer and be reliable for heading in autumn and winter. The diffi-

culty in this has led to the almost universal use of the Collard, which by the by is no mean vegetable after frost has made it tender. The practice of calling any Cabbage that has failed to head a Collard has given this vegetable a bad name with those who have never tasted a real Georgia Collard. The difficulty in raising the plants in hot summer weather is one of the greatest obstacles to the raising of winter Cabbage here, and it seems to me that growers at the north or in the mountains might make a good thing by supplying the low country with plants for setting in August and September.

Since southern growers have found out that the best Potatoes for winter use and the best seed for spring planting are grown here from seed of the early crop planted in August, there has been a large development in this line, and it will not be long before the south will grow its own supply of winter Potatoes, and be able to supply unsprouted potatoes north late in spring. We will always have to buy enough of northern grown seed potatoes in spring to raise our late seed from, for I do not think the process can be carried profitably beyond one season. Formerly there was difficulty in getting the potatoes to grow which were planted in the heat of summer. This arose from the universal impression that they should be planted deep at that season, while the fact is they should be barely covered in the soil and heavily rolled. Planted thus all will grow and the soil is plowed toward them as they advance. Last fall we dug potatoes on the sixth of December which did not appear above the ground until after the middle of September, and the crop was much better than those planted late in July and which had the whole hot weather for their early growth. Late autumn is almost sure to give us good potato weather, while August is apt to be too hot and dry. Therefore potatoes planted from middle to last of August will generally surpass those planted earlier. This late crop of potatoes we consider to be one of remarkable interest to the south and at our station a series of plantings will be made this year with a view to test the best time for planting.

North Carolina College of Agriculture, Raleigh.

W. F. Massey.

Cypripedium barbatum.—This species belongs to that beautiful group of "Ladies' Slippers" characterized by their marbled foliage. It forms one of the most attractive sights in the Orchid houses during May and June, during which time the beauty of the foliage and flowers is, as it were, combined. The leaves are about six inches in length, oblong-lanceolate, pale green; with darker green oblong bars marbling the upper surface. The dark purple hairy scapes are about a foot high, and usually bear one, though not infrequently two large and handsomely colored flowers, the roundish upper sepal of which forms the chief attraction. It is white above, green at the base and vertically marked with broad, dark purple stripes, while across the centre there usually extends a more or less conspicuous crescent-shaped zone of vinous purple, the richness of which distinguishes a good variety from a bad one. The margins of the linear-oblong, slightly depressed petals are thickly fringed with dark, shining hairs, a circumstance which led Dr. Lindley to apply the specific name—although one, nowadays, just as applicable to several other species, which, however, were unknown when *C. barbatum* was christened. The surface of the petals is green at the base, passing into deep purple toward the tips, while the upper margin (and sometimes the lower also) is adorned with a row of blackish shining warts. Dark purple is the color of the helmet-shaped lip, except on the pale inflexed side lobes, which are studded with small dull purple warts.

Great variation exists in the size and color of the flowers of *C. barbatum*—or, as it may be popularly termed, the bearded "Lady's Slipper"—and this fact has given rise to a host of unauthorized fancy names, which are to be found in most trade catalogues. This variation, of course, is caused chiefly by cultivation and is of like consequence in the naming. One variety, however—that known as Crossi or Warneri—is worthy of distinction, and is recognized by its paler and more densely growing foliage, and by its flowers being of an exceptionally rich color. Of course, such a plant as *C. barbatum* could not escape the toils of the artificial hybridist, whose operations with it in combination with other species have resulted in such fine hybrids as *C. Harrisianum* (the first artificial *Cypripedium* raised), *C. euryandrum*, *C. selligerum*, *C. vexillarium* and others.

It has been almost half a century in cultivation, having been introduced from Mount Ophir, near Malacca, about 1840, by Cuming, who sent plants to Messrs. Loddiges, of Hackney, in whose nursery the first flowers appeared. Since that time it has been looked upon as a very useful plant, both for decorative and exhibition purposes, and a great improvement in the

size and color of the flowers has taken place under cultivation, as will be readily seen by comparing blooms of to-day with those figured in the *Botanical Register* in 1842. The best means of producing an effect with *C. barbatum* is to grow several plants together in broad, well drained, shallow pans. A warm, moist atmosphere is most suitable, and the plants may receive plenty of water at all times, except in the cold, dreary months of the year, when very little will suffice to keep them in proper condition.

Isleworth, London, W.

John Weathers.

Moræa Pavonia.—It is just a century ago since this very desirable bulbous plant was introduced to England from the Cape of Good Hope. It is now well known in English gardens, but still scarce in this country. The somewhat weedy appearance of the plant and the straggling habit of its long grassy leaves give some excuse for this neglect on the part of those who have never seen it in bloom. The flowers measure almost two inches across, and are borne singly at the top of slender, knotted peduncles, which vary in length from nine to eighteen inches, or about half the length of the leaves, according to the size and quality of the bulbs. In general appearance they bear a strong resemblance to those of some small-flowered species of *Iris*; and, as is usual in that genus, the outer segments of the perianth are the most conspicuous. The blade of each outer segment is reflexed, and of a lilac-tinged white color, with large blotch of rich peacock blue at the base. The under side of the blade is beautifully streaked with purple, but is by no means so attractive as the upper surface. The only objection to the flowers is the brief time (seldom more than a day) they remain expanded; but they are freely produced during the spring months, and this compensates in some degree for their fugacity. The cultural requirements of this plant are of the simplest. The bulbs should be potted in fall, about six to a five-inch pot, and placed in a sunny greenhouse, or in a frame which can be secured against frost in winter. Carefulness in watering is most important, as an over-supply is dangerous at any time. After the flowering season the supply of water may be gradually decreased, and finally withheld until the bulbs are again potted. The bulbs remain in good condition if kept in the pots during the summer months, and should then have free exposure to air and sunshine, but they must be kept out. The number of plants may be increased by separating the clusters of bulbs at potting time. I lately saw a very fine collection of plants of this species grown by an amateur with no better accommodation than that afforded by a sunny sitting-room window.

There are few plants with a longer list of synonyms, a fact which perhaps may indicate its popularity in England, where the names originated. Some of these are *Iris Pavonia*, *I. tricuspidata*, *Viesseuxia Pavonia* and *V. glaucopsis*. It may be remarked that the latter genus is now included under *Moræa*. This plant is also commonly known as the "Peacock," or "Blue-eyed Peacock Iris."

Cambridge, Mass.

B.

Propagating Chrysanthemums.—On the publication of my note in the issue of GARDEN AND FOREST for January 15th on the propagation of Chrysanthemums from detached stems, one of the largest propagators of this plant wrote me that "the shoots would be good for nothing, as they would harden up, throw buds and flower prematurely." This promise does not seem to have been carried out, and I note that from my layered stems some of the shoots are as strong and vigorous as could be desired and give every promise of growing on as freely as the best of my cuttings. In one or two cases the shoots showed bud and ceased to develop, but this was not general. There was no sign of hardening up in any case. "Hardening up" is a bugbear which should not trouble any one whose plants have not been made soft and sappy in heat, and even then, if care is used in gradually exposing them to air, in planting very firmly—an important detail—and in protecting from winds, there should be no losses from this cause. This experiment seems to illustrate the fact, known to observers of the Chrysanthemum, but not often noted, that the matured stems of this plant do not under proper conditions cease their functions until the young growths have made some headway in the spring, and until those fortunately placed have made some progress toward forming independent roots, after which they decay rapidly. The old stems seem either to have some vitality stored in them, bare though they may be of foliage, or perhaps they may only be open to the flow of sap and a mere channel for the conveyance of nutriment from the awakening roots, though my experiment would seem to show that root action was not essential. The strongest shoots are shown by the Chrysanthemum as the sun

warms them into growth in the early spring (April here); and their strong tendency to form roots can be observed on those near the base of a stem but above the ground, which often throw out roots into the air. In overhauling the stock in the spring, one often finds an old stem with a shoot so far above ground as to have had no chance to root. If this is treated early like a grafted plant and buried so that the junction is covered, the shoot will soon make separate roots, and by the time the old plant loses its vigor, will be prepared to grow on without check.

Elizabeth, N. J.

G.

Clanthus Dampieri.—This is one of the most gorgeous flowered, and at the same time one of the "miffiest" of the many Leguminous plants which we owe to Australia. There are few gardeners who have not been tempted by pictures or descriptions of its beauty to attempt its culture, but the number of those who have been successful is very small. There is, however, a way to success, and that is by grafting seedlings of *C. Dampieri* on young plants of *C. puniceus*. This gets one over the water difficulty, for whilst the first named invariably goes wrong at the root, presumably through excess of water, *C. puniceus* is not so particular. The seeds should be sown in April and the seedlings cut off at the base and grafted when about six inches high. A union is effected in about three weeks.

Eurycles sylvestris and *E. Cunninghamii* are the only two species of a genus of *Amaryllideæ*, and are closely related to *Eucharis*. They are natives of Australia and the Malayan regions, whilst *Eucharis* is confined to South America. In the stove at Kew both species of *Eurycles* are in flower and they are quite ornamental enough to be classed with useful stove bulbous plants. *E. sylvestris* has a cordate leaf a foot across, a scape a foot high, and from twenty to thirty flowers in a dense umbel. Each flower is two and a half inches across, not unlike *Eucharis candida* in form and pure white. *E. Cunninghamii* has smaller and ovate leaves, and smaller flowers in umbels of from ten to fifteen. The plants lose their foliage in autumn, when they should be rested until February and then started in a stove.

Kew.

W.

Chionodoxa Lucilæ alba.—I will watch with interest Mr. Gerard's experiments with the seeds of the White *Chionodoxa*. I have tried it for two generations, and with me the seedlings invariably revert to the type.

Exochorda Alberti.—This is a very beautiful shrub, introduced from central Asia by Messrs. Albert and Eduard von Regel. It attains a height of about six feet, and all last year's growths are covered by spikes of pure white flowers, eight to ten on a spike, and about the size of large peach blossoms. Their striking appearance is heightened by the shining green foliage. It is in full flower now, on 6th of May.

Baden-Baden.

Max Leichtlin.

Correspondence.

State Control of the Gypsy Moth.

To the Editor of GARDEN AND FOREST:

Sir.—All sensible people must heartily agree with the sentiment expressed in the editorial on "Legislation Against the Gypsy Moth," in GARDEN AND FOREST for March 26th, in which legislation against insect pests is urged, and the passing of such laws as will compel careless landholders to destroy noxious insects on their properties, so that they may not be a constant menace to more thrifty neighbors. But while many people no doubt approve of legislation by the state of Massachusetts against the Gypsy Moth at Medford, a large number feel very strongly that it is impossible to accomplish the end sought. Even if the insect had extended little beyond the bounds of the district originally assigned to it, the chances for the complete extermination of the pest were very slight. But after the Act* regarding it and the appropriation of \$25,000 had been pushed through the Legislature, and the Gypsy Moth Commission appointed by the Governor had assumed its duties, it was found that the insect had spread over a territory very much larger than was at first suspected. Instead of occurring only in Medford and occupying "an area in the form of an ellipse about a mile and a half long by half a mile wide," the insect is found throughout that town and over a territory ten miles long by five or six miles in width. It is in the towns of Winchester, Arlington, Somerville, Stoneham, Melrose,

* An act to provide against the depredations by the insect known as the *Ocnervia dispar* or Gypsy Moth, and against its spreading and for its extermination, in this commonwealth.

Malden, Everett, Revere and Chelsea. It is admitted that it has got into the Middlesex Fells, a natural park dear to every naturalist and lover of nature about Boston, and there is little doubt that the pest is within the limits of Cambridge.

The greater range of the pest naturally necessitates increased expense in the attempt to control it, and it is expected that the Legislature before adjournment will grant another appropriation at least as large as the first.

Since the Commission was organized the destruction of the Gypsy Moth has been vigorously pushed. The clusters of eggs were first attacked. These were found on the trunks and larger branches of trees and shrubs, on fences, walls, buildings, piles of lumber, etc. The principal means used in destroying them was lighted kerosene torches, by which the eggs were burned in the positions in which they were found, and the trunks and limbs of the trees plainly show wherever the torches were applied. This work was begun at the end of March and was continued for several weeks. Sixty or seventy men were employed and a hundred barrels of kerosene used. In some cases it was found necessary to pull down stone and other fences in order to get at the eggs. Many acres of infested woodland have been cut down or have had all the underwood removed and burned.

Very early in May the young larvæ were found to have hatched from the eggs, and on the twelfth of the month spraying the vegetation with insecticides was begun. At present a dozen machines are at work, and this number is to be increased.

Each equipment consists of a large cask or hogshead, mounted upon a cart or wagon, a force pump and from 100 to 200 feet of hose with nozzles, besides ladders and some other accessories. The poison chiefly used up to this time is Paris Green, diluted to the proportion of one pound of Paris Green to 150 gallons of water. Five men are employed with each spraying apparatus. The law invests the Commissioners with the power to enter and work in any private property in pursuit of the Gypsy Moth. Trees, shrubs, vines and garden plants of every description are usually all sprayed, but it is not intended or thought necessary to spray grain or grass and a few similar crops. It will be necessary to do the spraying several times over in order to clear the infested ground of all larvæ, and nobody expects that the desired results will be accomplished in one season. The law imposes a severe penalty by fine and imprisonment upon any one who knowingly carries the living insects to other places. But no systematic regulations have been made looking to the prevention of the further spread of the pest. Some farmers, who carry large quantities of manure, etc., out of Medford, have had to agree to carefully examine their loads to see that none of the insects are carried out with them when they pass beyond certain limits of the town. I have not learned that any railroad train is subject to examination before leaving. There are tanneries, brickyards and other industries carried on at Medford, and many freight cars are always about either with or waiting for loads, and the possibility that in the course of the years in which it has been in the town, the insect in any of its stages has already been carried to far distant points can be understood by those who are familiar with the history of the introduction and distribution of other obnoxious animals. It is maintained by some that the sluggish habit of the large female moths is against its having spread far, and that such a conspicuous insect could not have reached other places without having been detected. But it is a remarkable fact that the Gypsy Moth, within five miles of Boston, and which must have been increasing for about twenty years, was for so long a time never noticed or reported by an entomologist or distinguished by any one from an ordinary native "moth miller."

Professor C. V. Riley's success in combatting the Cottony Cushion Scale in California by the importation of its Australian parasites, very naturally raises the question whether a little money spent in the introduction of some of the most effective parasites of the Gypsy Moth in Europe may not finally be the best way to keep it within reasonable bounds in this country.

Indeed, it is stated that Mr. Trouvelot, who is known to have been the unlucky agent in the introduction of the Gypsy Moth, had to give up all his attempts at raising silkworms at Medford on account of a fatal disease which he also accidentally introduced, and which is said to have destroyed immense numbers of other native species of insects besides the silkworms. It was supposed that the disease had destroyed all of the escaped Gypsy Moths.

If the Legislature makes further grants of money under the almost absurd idea of compassing the extermination of the pest, there is likely to be some disappointment in the results after the lapse of a few years. But if the appropriations are given with the understanding that they accomplish the tem-

porary control of the insect in the infested region, the liberal use of Paris Green is going to give Medford and surrounding towns temporary freedom from foliage-eating insects of all kinds, and, in consequence, the vegetation of the region should be the fairest in the commonwealth.

Arnold Arboretum.

J. G. Jack.

What is an Orchid?

To the Editor of GARDEN AND FOREST:

Sir.—Will some one tell me what properly constitutes an Orchid? They are "peculiarly formed," I know, but so are other flowers which are not classed with this family of *Orchidaceæ*. It was my childish belief that Orchids grew in the air only, but this error of childhood is corrected by my acquaintance with *Orchis spectabilis* and *Cypripedium pubescens*, also *Cypripedium acaule*, all three of which are now growing in my rockery. And last year I found in one of our charming lanes the *Spiranthes simplex*—Ladies' Tresses—another earth-growing Orchid.

Catskill, N. Y.

E. F. B.

[All Orchids are not "Air-plants," so called. Our native species, without exception, grow in the ground, although many of those which flourish in the tropics and which are cultivated in temperate countries under glass receive their nourishment from the moisture in the air. Plants of the Orchid family differ from all others in the arrangement of their organs of reproduction, which are united into a column composed of a single, or, in case of the Lady's Slipper, of two stamens coherent with or borne on the style or thick fleshy stigma. The perianth of the flower is composed of six divisions, arranged in two sets, each of three. The three outer divisions are called sepals, and often resemble in texture and color those of the inner set, called petals. One of the inner set of these divisions differs from the others in shape and direction, and is called the lip—the sack of the Lady's Slipper. This is really the upper petal—that is, the one next to the axis of the flower—but by a half twist of the ovary it is made to appear as if it were the lowest. These elements—sepals, petals, lip and column—varied almost without limit in form and color, combine to produce the almost infinite number of widely differing forms which are so fascinating in their oddity, quaintness and beauty. Orchids are found in all warm and temperate parts of the world, although they are more abundant in the tropics than elsewhere. They are perennial plants, often with tuber-bearing roots, and the peculiar structure of their flowers renders impossible their unaided fertilization, for which they depend on the visits of insects.—Ed.]

Planting Street Trees.

To the Editor of GARDEN AND FOREST:

Sir.—Your article on street trees recalls an example similar to the one you cite. I was engaged on some public works in a western city and was consulted by the city government about planting a principal avenue. In reply to an inquiry I stated my terms for taking charge of the work, which were pronounced satisfactory. A few days after I was informed that the city government had found a man who had offered much more favorable terms, which had been accepted. As I had to pass through the avenue every day I could watch the progress of the work. The trees were Elms, brought from the fields, eight or ten inches in diameter, and, as I learned, were furnished and planted for \$16 each. They would average twenty-five feet in height, but had been cut in so that they showed only stumps of branches, and for roots each one had a knob at the bottom which could almost have been put in a bushel-basket. There was no preparation of the ground, but the holes were dug large enough to receive the so-called roots, and the trees were stuck in and the knobs buried. This was in the spring, and 246 trees were thus planted at a cost of \$3,936. On the 31st of June of the following year only eighty-four trees showed any sign of life, and not one of them would have been suffered to remain in any properly cared for grounds. One year later only thirty-one put out a leaf here and there, and soon these were removed as worthless.

No doubt some of the members of that City Council prided themselves for looking closely after the public interests and getting the avenue planted with such fine large trees at such a low cost.

Minneapolis, Minn.

H. W. S. Cleveland.

Horticultural Society of Japan.

To the Editor of GARDEN AND FOREST:

Sir.—A meeting of this Society was held at Uyeno Park, Tokio, on the 9th of March, in the building of the Japanese Art Association, with the President of the Society, H. E. Hanabusa, in the chair. The hall was beautifully decorated with collections of rare and showy plants and works of art, among which was a model of Korakuen, a well known garden of Tokio, beautifully executed, with other equally interesting models, landscape designs, hedges, porcelain seats, stone lanterns, bird cages, stones of curious shape, and, in a word, everything needed to make an attractive garden. Choice vases for flowers, and rare pieces for tea ceremony, were also worthy of attention. Quite as praiseworthy were the flowers and works in marble to represent forms of European gardening. There were implements of gardening from the Department of Agriculture, photographs of famous European garden-scenes, and a valuable library of reference works on gardening, both Japanese and foreign. It was said that the exhibition surpassed in interest the display of the Horticultural Department of the Industrial Exhibition now open in Tokio.

The first address was by H. E. Tanaka, Vice-President of the Society, and one of the leading naturalists of the time. "Instruments of Gardening" was the subject of Mr. Ikeda, and the meeting concluded with an instructive address by H. E. Enomoto, Minister of State for Public Education. H. E. Mayeda, Vice-Minister of the Agricultural Department, was present, and during the evening Mr. Tanaka introduced a magic lantern, with many illustrations and figures relating to horticulture.

This Society promises to be a considerable factor in the horticulture of the country.

Tokio, Japan.

Iwabuchi.

Recent Publications.

How Crops Grow. A treatise on the Chemical Composition, Structure and Life of the Plant for students of agriculture, by Samuel W. Johnson, M.A. New York, Orange Judd Company, 1890.

This is a new edition of the well known and classic work which appeared more than twenty years ago, and which, with its companion treatise, "How Crops Feed," holds the first rank among American contributions to agricultural science. Since these works were originally prepared, our knowledge of the processes of plant nutrition and of the other subjects considered in them has greatly advanced, and this revision is an exposition of the present condition of the science of agriculture—so far as it is based on the chemical composition of plants, their structure and life. As the author points out, agricultural science in its widest scope comprehends a vast range of subjects and lays under contribution almost every department of human learning. It is closely concerned with the sciences of geology, meteorology, mechanics, physics, chemistry, botany, zoology and physiology, as well as with social and political economy. The topics treated in this volume, however, are those which directly interest the farmer in his daily dealings with plants, soils and fertilizers, or, to quote Professor Johnson's words in the introductory chapter of the volume: "How the plant grows—the conditions under which it flourishes or suffers detriment—the mode of its construction and organization—how it feeds upon soil and air—how it serves as food to animals—how the air, soil, plant and animal stand related to each other in a perpetual round of the most beautiful and wonderful transformations—these are some of the grand questions that come before us; and they are not less interesting to the philosopher or man of culture than important to the farmer who depends upon their practical solution for his comfort; or to the statesman who regards them in their bearings upon the weightiest of political considerations." In this clearly defined field Professor Johnson's writings have proved not only of practical advantage to working farmers, but they have commanded the respect of men of science, and perhaps no other agency in the country has been so potent in encouraging serious research in the sciences related to agriculture and in elevating the character of agricultural discussion in the periodical press.

Perhaps one of the most important services rendered by this book has been its influence in establishing the practical value of science to the farmer—in showing him that genuine science is not something remote and fanciful, but immediately useful truth. The persons who hold that there is an essential conflict between theory and practice, and that narrow individual experience is of greater value in agriculture or horticulture than the wider generalizations of science, should study these

sentences, which are taken from the introduction to "How Crops Grow": "Science employs, in effecting its progress, essentially the same methods that are used by merely practical men. Its success is commonly more rapid and brilliant, because its instruments of observation are finer and more skillfully handled; because it experiments more industriously and variedly, thus commanding a wider and more fruitful experience; because it usually brings a more cultivated imagination and a more disciplined judgment to bear upon its work. The devotion of a life to discovery or invention is sure to yield greater results than a desultory application made in the intervals of other absorbing pursuits. It is, then, for the interest of the farmer to avail himself of the labors of the man of science, when the latter is willing to inform himself in the details of practice so as rightly to comprehend the questions which press for solution."

It is needless to add that Professor Johnson has taken care to inform himself on the points where science and practice come into contact, and that the revised edition neglects none of the important discoveries in physics, chemistry or biology which, in recent years, have done so much to aid the farmer in his legitimate work of winning from the soil at the least cost the greatest possible amount of certain animal and vegetable products.

Notes.

The new crop of sweet potatoes is beginning to come in from the south. Gooseberries, too, are now found in market, and apricots from California are already quite plentiful.

A Mr. Lathan, of Eddisburg, near Liverpool, possesses a gigantic *Camellia* twenty feet in height, as much in the diameter of the head, and thirty inches around the stem, from which he annually sells \$300 worth of flowers.

Our esteemed correspondent, Dr. Charles Bollé, of Berlin, has recently been appointed inspector of the Department of Parks and Gardens of that city, a position which will enable him to make available his great knowledge for the benefit of the public.

A Pine Forest Land Improvement Company with a capital of \$1,000,000 has been incorporated at Lakewood, New Jersey. A new hotel will be built by the association, but it is understood that it will give special attention to the preservation of the Pine lands of the county and to the planting of new tracts.

Professor Green, of the Ohio Experiment Station, recommends the use of rubber bands in bunching asparagus as less likely to injure the stalks than unelastic strings. To fit the band around the upper end of a bunch the heads of the shoots may be placed in a teacup, and the band gently slipped from the cup around the bunch.

By order of the court a Rhenish railroad company recently paid \$625 for five full grown and five young Apple-trees, which stood on a bit of ground that had been condemned for its use. Another company in Prussia was obliged, in the year 1886, to pay \$600 for a single Cherry-tree, as it was proved that its product annually sold for at least \$25.

A recent issue of the *Rural Pacific Press* contains a portrait of a remarkable specimen of Dr. Parry's *Arctostaphylos Manzanita* growing at Helena, California. It is a wide-spreading shrub separating into several branches just above the surface of the ground, where the short trunk girths eleven feet and six inches. It has attained a height of from thirty to thirty-five feet, the head spreading thirty-six and thirty feet in the two directions.

The Paulownia is flowering this year in the Public Garden in Boston, a very unusual, if not an unheard of occurrence in eastern Massachusetts, where the tree just survives, forming its flower-buds sometimes in sheltered situations, and then almost invariably losing them again during the winter. It usually flowers well in this latitude, however, and the trees in Central Park are still covered with beautiful and fragrant blossoms.

Foreign journals state that Herr Bornmüller, while exploring the districts east of the Black Sea, recently discovered a new Poplar, a natural hybrid between *Populus alba* and *P. nigra*. It resembles the former in the large sharp teeth of its leaves and in the thick white tomentum which covers the lower surface of the young leaves and twigs, while it approaches *P. nigra* in the three-cornered shape of the leaves, which later become entirely green.

Reports from Tiflis say that the phylloxera has invaded parts of the Caucasian region where hitherto it had been unknown,

large quantities of infected vines having been discovered in the province of Kutais. Radical measures are to be used to stamp out the pest, but the enormous extent to which it has already spread will render them difficult of application, and the government has arranged that experiments shall at once be made with American Vines.

Monsieur Croux, the French nurseryman, exhibited, according to a report published in a late issue of the *Revue Horticole*, an interesting collection of Magnolias before the National Society of Horticulture of France. The collection contained, besides the varieties of the Chinese Magnolias ordinarily cultivated, *Magnolia spectabilis*, with small white flowers flushed with pink; *M. hybridia speciosa*, described as similar to *M. Soulangeana*, although later in blooming; *M. Norbertinia*, the latest flowered of all the Magnolias derived from *M. conspicua*; *M. rosa grandiflora*, a seedling raised by M. Lenné, with large, handsome rose and white flowers and one of the best varieties, and *M. odoratissima*, a hybrid between *M. conspicua* and *M. Lenné* with large, rose-white, fragrant flowers.

In an article recently published in the *Fortnightly Review* Mr. Beatty-Kingston names 10,000,000,000 francs as the amount of the loss suffered in wine-growing France between the years 1875 and 1887 by the ravages of the phylloxera and fungoid pests. Now, however, they seem to have been definitely vanquished. In the Médoc district the vines have recovered themselves since 1882, when the ground around them was saturated with a solution destructive to the phylloxera; and the yield for the three past years has greatly exceeded the previous average, and, indeed, has prophesied a future yield of unparalleled richness. Last year the vineyards of Château Lafitte alone produced 1,200 hogsheads of wine, and 66,000,000 gallons were produced in the Gironde district.

The Annual Administration Report of the Forest Department (Southern and Northern Circles) of the Madras Presidency for the financial year 1888-1889 has reached us, and contains a large amount of technical information with regard to the workings of the department, with notes upon various plants cultivated on a larger or smaller scale by the forest-department. It appears that three hundred and ninety-eight square miles of reserved forests and one hundred and forty-five square miles of reserved lands have been added during the year to the areas under the immediate control of the department. The financial results of the year show a handsome balance in spite of numerous extraordinary expenses, and demonstrate the success of forest-administration in India.

In the last number of the *Revue Horticole* which has reached us the attention of cultivators of the Lilac is directed to the fact that the regular blooming of the Lilacs in the public gardens of Paris is obtained by an annual pruning, which serves also to keep the plants in shape and within reasonable bounds. Every year, after the flowers have passed, the flowering branch is cut back to the bud at its base. By this means all the strength of the plant is thrown into the branches which have not flowered. These branches then grow vigorously, and are thus able to develop the terminal buds which assure the flowers of the following year. The practice is one which might be more generally observed than it is, especially as Lilacs, unless they are pruned, occasionally grow beyond ordinary limits and do not always flower regularly every season.

Among the rare Orchids now in flower in the collection of Mr. F. L. Ames, North Easton, Massachusetts, are three varieties of *Cattleya Reineckiana*, one of the specimens with twenty and the other with sixteen flowers; *C. Wagneri*; six fine plants of *C. Warneri*; *C. Mendelii grandiflora*; *C. imbricata*; *C. Mossiæ aurea* and *C. Mossiæ Peetersi*; *Oncidium Kramerii lutea*; *Cælogyne Dayana* (seven spikes); *C. tomentosa*; *Eriopsis rutidobulbon*; *Epidendrum O'Brieni*; *Maxillaria Sanderiana*; *Dendrobium polyphlebium*; *Cypripedium Mastersi*; *C. Euryale*; *C. Curtisi*; *C. leucorrhodum*; *Odontoglossum excellens*; *Masdevallia ignea Goorei*; *M. Harryana regalis* in variety; *M. Geleniana*; *Dendrobium Falconeri giganteum* and half a dozen of the best varieties of *Lælia purpurata*, all superb plants. Here, too, is a specimen of *Cattleya Skinneri*, which is more than six feet in diameter, and bearing forty spikes, with some 400 flowers altogether.

Concerning the plant *Aristolochia Goldieana*, which has been flowering at Kew and which has been described in these columns by our London correspondent, the *Journal of Horticulture*, speaking of the beauty of the flower and its grotesque disproportion to the plant which produced it, says: "The plant might have been crumpled up into a man's hand, but the one flower it produced could not have been

perfectly concealed in a peck measure. The tube was ivory white; the spreading limb formed a huge goblet, on the outer side dull green, lined and veined with dull purple; on the inner side superbly colored with bold lines and arabesque markings of a deep purplish chocolate on a rich ground of old gold. The penciling in the throat was even more beautiful than in the cup, and the translucent texture added an indefinable charm, as though the material were of a kind hitherto unknown in the vegetable kingdom."

Monsieur E. Gilbert, discussing in the *Moniteur d'Horticulture* the early days of horticulture (L'Horticulture dans ses origines sacrées ete profanes), tells us that in the Middle Ages medlars held the first place among cultivated fruits. It was the medlar, it seems, which was used as the foundation of the preserves of Orleans known as Cotignac, which were so famous that when a French sovereign entered the town a box of Cotignac was always offered to him, and it was a box of these preserved medlars which was the first present made by the people of Orleans to Joan of Arc when she led her troops to the assistance of the beleaguered city. The medlar was used as a preserve as well as to season meats, just as cresses are used now. The introduction of the Bon Crétien Pear, which is the same as the American Bartlett, dates, Monsieur Gilbert tells us, from the reign of Louis XI., during which the venerable Francois de Paule brought it from Spain and introduced it into the royal gardens. During his fatal sickness the King asked for this fruit to quench his thirst, calling it "the pear of the good Christian," in honor of the holy man who had brought it to France. And the pear Louise-Bonne owes its name, it appears, too, to Louise of Savoy, the mother of Francis I., who first cultivated it in France.

The death is announced of Monsieur Alphonse Du Breuil in his eighty-fifth year. Monsieur Du Breuil was one of the most popular and best known authors and lecturers on the management of fruit-trees in France. He was born at Rouen in 1811, in the botanical garden of which his father was the head gardener. He commenced his career as a lecturer in the Normal School and in the School of Agriculture of his native town, where, later, he established in the Botanic Garden a remarkable collection of fruit-trees. Called to Paris, he first became conspicuously known by a course of lectures on the cultivation of fruit-trees delivered in the Conservatoire des Arts et Métiers. In 1853 the French Minister of Agriculture employed him to travel over France for the purpose of giving instruction in the cultivation of fruit-trees. This duty he performed during many years, traveling during six months in all the departments, where he trained many local instructors. Monsieur Du Breuil is best known to the general public by his "Cours d'Arboriculture," published in 1846, a work which had much success and ran through several editions and of which a résumé was published for the use of gardeners. Monsieur Du Breuil's influence must have been very great in his day, and the effects of his instruction are seen not only in the excellence of the French methods of cultivating fruit-trees, but purely ornamental trees as well, to which he devoted much attention.

The most conspicuous of the shrubs now in flower in Central Park are the various Weigelas, which are blooming in remarkable profusion. The masses of *Deutzia gracilis* are also strikingly beautiful. There are many good specimens of the Virginia Fringe-tree, a particularly fine one being on the borders of the lake near the Webster statue. The old-fashioned Snowball, with its flowers hanging in great clusters from the ends of arched branches, is still at its best, and it has no superior among later introductions. The Japanese Snowball (*Viburnum plicatum*) makes a compact bush, and is very effective for a mass of bloom, but it lacks the grace of the older plant, and can never supersede it. The white *Crataegus pyracantha* shows now to best advantage, a mass of it near the Bolivar statue being especially worthy of mention. The early flowering Tamarisks, too, wherever they were subjected to a severe pruning last year, have been uncommonly floriferous. One of the most interesting spots in the park for lovers of flowers is the great irregular mass of *Rosa rugosa* near the conservatory lake. A group of the real Scotch Broom (*Cytisus scoparius*) near the Terrace is much admired for the abundant yellow flowers, which can be seen at a great distance. An excellent place to see many of the best shrubs in bloom is along the new branch of the bridle path bordering the pool near Seventy-seventh Street; and besides the shrubbery one can here see a fine effect of the Japanese Ampelopsis on the boundary wall. Only a portion of the stone is covered, and the proper character of both stone and vine and their true relation have been retained.

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The American Elm.

THE Elm-tree is dear to the heart of the New Englander. No other tree is so associated in his mind with the idea of home; it forms the most remarkable feature of the domestic New England landscape, and in no other part of the country is there a tree which occupies the same position in the affection of the people as the Elm does in that of the inhabitants of New England. The people who settled the shores of Massachusetts Bay brought with them the remembrance of the Elm-trees which were such an important and conspicuous feature in the country where they had been bred; and it is not surprising that they sought to reproduce in the new country something of the old by planting by their doors the most familiar of the English "roof trees." So the habit grew of setting an Elm-tree close by the home hewn out in the wilderness, and these house-trees, planted by the early settlers of New England or by their descendants of the early generations, are the oldest and noblest trees which have been planted by man in North America.

The American Indians were not planters of trees, but they discovered the white man's love for them, and the story is told that in Massachusetts early in the last century a party of them came to the Reverend Oliver Peabody, the pastor of Natick, and the successor of Elliott, the apostle of their race, bearing two Elm-trees on their shoulders and begging that they might be allowed to set them out before his door as emblems of friendship. The larger of these two trees was struck by lightning and destroyed ninety years afterward, when the trunk girthed twenty-one feet just above the ground. An account of these trees and of two other Elms planted by the Indians in 1753 in front of the house of Mr. Peabody's successor, the Reverend Stephen Badger, as a sign of their respect for him, appeared in the fourth volume of the *New England Farmer*, published in 1826, from the pen of Mr. John Welles.

The affection for the Elm-tree, thus early developed in the New England heart, often saved it when the land was cleared for cultivation; and when roads were made and provided with trees, as they were more generally in New

England a hundred years ago than they are now, the Elm naturally was selected to shade the traveler from the burning sun of summer. The noble stem supporting the broad head of light and pendulous branches, the delicate spray, indescribably beautiful in winter, and the abundant foliage of summer, make the American Elm one of the most desirable of road-side trees when placed in a suitable situation, and a fitting ornament to stand by the stateliest mansion or the humblest farm-house.

The illustration on page 287 shows a fair example of a typical New England Elm a century old. It has been made from a photograph taken by Dr. William H. Rollins, of Boston, of a tree planted a hundred years ago in the town of Sandwich, New Hampshire. The soil in which this tree has grown is dry and rather sterile, and the tree is not an exceptionally large one for the age, the trunk girthing only twelve feet at three feet above the ground. The effect of the poor soil is already apparent, and the leaves are smaller and drop earlier in the autumn than they did ten years ago, for the American Elm will not live to a great age or develop all its beauty in every situation. It dreads drought and starves in poor soil; its home is on fertile intervals along streams, where the deep alluvial soil is never dry and where plant food is never lacking. The Elms which grew to such great size by the farm-houses of New England owed their stature to the nourishment stolen from the neighboring garden, or to the moisture drawn from the well which their branches shaded. Thus they grew to great size and lived out their span of life, which at the best is not very great, for the Elm is a fast-growing tree, and rarely lives during a longer period than two centuries or two centuries and a half. The most vigorous of them begin to show the first signs of decay before they have seen a century and a half go by, and an Elm a hundred years old in perfect health is now difficult to find, except on some exceptionally fertile river-lands like those which border the upper Connecticut. Our Elm, therefore, being so impatient of drought, and being so dependent on abundant nourishment, is not a safe tree to plant in all sorts of soils and situations, although it has long been the habit to plant it everywhere in some parts of the country. As growth and vigor diminish insects multiply; and none of our trees suffers to such an extent from their ravages. There can be no more forlorn spectacle, certainly, than the rows of half-grown, stunted Elm-trees which may be seen in our cities and their suburbs, disfigured by the canker-worm and by hordes of other insects. The Elm is one of the best of trees to plant where the soil is deep and rich and where moisture is abundant and constant; it is one of the least desirable of all trees to set by the side of city streets, where plant-food is always lacking and where moisture is quickly carried off by the artificial drainage of road-bed and service pipes. Give it a fair chance and the American Elm will hold its own against any tree in the world in its own peculiar light and graceful beauty; but, unless all the conditions favor it, there is no tree less satisfactory, and it should not be planted unless these conditions can be supplied.

North America, or the eastern half of the continent, for no Elm grows naturally in the far west, is well supplied with Elm-trees. The American Elm (*Ulmus Americana*) ranges from Newfoundland to western Texas, and from the Atlantic seaboard to the eastern base of the Rocky Mountains. The Slippery Elm (*Ulmus fulva*), dear alike to the youthful heart and to that of the purveyor of nostrums, is widely scattered over a large portion of the eastern part of the country. In the south the Wahoo (*Ulmus alata*), a much smaller tree than the American Elm, with corky branches and small foliage, grows by the banks of streams and is now often planted as a roadside tree. The Rock Elm, known to botanists as *Ulmus racemosa*, because the flowers are produced in short racemes, inhabits the western states. This is little known still to cultivators, although of much promise as an ornamental tree, and although the wood which it produces is not equaled by

that of any other Elm-tree. The Cedar Elm of Texas (*Ulmus crassifolia*), so called, perhaps, because it grows among the Junipers (*Juniperus occidentalis*), which form a prominent feature of the vegetation of some parts of western Texas, is not surpassed in grace or in beauty of habit and of lustrous foliage by many American trees. It is a tree of medium size, and as it grows naturally in dry soil, it may be expected to flourish where other Elms would not, in regions of uncertain rain-fall like some parts of southern Europe and our Pacific-coast region. Eastern America, therefore, possesses five Elms; in Europe there are three species at the most, and, according to some botanists, only two; one of these, the tree which is almost universally called the "English Elm" in this country, although curiously enough it is not an English tree at all, having been introduced into Britain by the Romans, extends through Asia to Japan, where, and in China also, another species occurs. There are, at the most, therefore, four species in the Old World, so that more than half the Elms belong to our silva.

THE action of the Legislature of this state regarding forestry matters during its recent session, tends definitely in the direction of the acquisition of land in the Adirondack region by the state, and of the establishment of a large State Park, which shall include the sources of the principal streams of the state. The Forest Commission is empowered and required to investigate the subject thoroughly and to report its finding to the Legislature at its next session. This really places the whole matter directly in the hands of the people of the state for their decision. The result does not depend upon the Forest Commission, though its action is, of course, important and necessary. It does not depend, in any great measure, upon the individual judgment or preferences of the men who will be members of the next Legislature. It depends upon the intelligence, foresight and will of the people of the state, and very largely upon the expression of the people's interest and wishes regarding the matter through the press of the state during the coming summer and autumn.

These are the essential facts to be kept in view. The permanent maintenance of forest-conditions over extensive mountain areas around the sources of the rivers is necessary to the commercial prosperity of the city of New York, and is important to the towns and agricultural regions of the interior of the state. The Adirondack mountain, forest and lake region has an incalculable and ever increasing value to the people of the cities of the whole country as a wilderness, a land of unviolated natural solitudes, of sylvan beauty and peace. It should be forever a matchless sanitarium, a paradise for civilized anglers and hunters, an ideal refuge for escape from the burdens of toil and the fever of life in great towns. If the people of the state have the foresight and wisdom which are essential to their own prosperity they will decree whatever action and expenditure are found to be necessary for the establishment of an adequate and permanent forest-reservation around the sources of their principal rivers.

WE find the following paragraph leading the editorial column in a recent issue of *Popular Gardening*: "An English paper criticises the frequent use made of the unfortunate term 'landscape architect' by American landscape-gardeners, and thinks the word very descriptive of the formal, hateful work frequently done by them. Perhaps the criticism is not quite undeserved." We consider it altogether undeserved. Formal gardening, in the true sense of the word, as implying a symmetrical, architectural arrangement of surfaces and plantations, has rarely been attempted in this country; but the few instances where such an arrangement forms a feature in a park of generally informal character—as, for instance, the Mall and terrace in the Central Park—can surely not be described as "hateful." It is probable, however, that the English critic referred to the use of such minor formal elements as stiff

flower-beds and regular groups of exotic foliage-plants. Of this kind of work many hateful examples may certainly be found in America. Nevertheless, it is so far from characteristic of America that the American abroad is perpetually astounded by the sins of foreign gardeners. In England the newly developed love for hardy flowers has but added to the trouble, for one constantly sees shrubberies defaced by symmetrical rows of flowering plants placed along their borders; and instances of a purely natural treatment of lawns and plantations are now far rarer there than here. Formal gardening of the true sort is much better understood in France than with us; but formal features of the bad sort are there also much more universally introduced than here. In no European city, we can safely say, is there a park conceived in so purely naturalistic a way and kept so free from inharmonious details as the Central Park. The Thiergarten, in Berlin, by far the most beautiful park in Europe, cannot be compared with it, as this is rather a carefully tended and cultivated forest than an artificially formed and yet natural looking landscape. From end to end the Bois de Boulogne is defaced by immense flower-beds of shrieking colors, placed in the most inappropriate situations; the same is true of most portions of the large park of which the people of Lyons are so proud; and, in short, a journey through Europe, followed by one in this country, would convince the English critic that, whatever they may call themselves, our landscape-gardeners better deserve the name of artists to-day than those of any other land.

Trees in Their Spring Attire.

AT this season of the year we may realize more fully perhaps than at any other how deficient our ordinary text-books are in their descriptions of trees, and what feeble pictures, after all, they supply. The reason, of course, is that for the most part the botanist sees the trees in one or two stages of their growth only, or is even often compelled to confine himself to the dried specimens in the herbarium. Moreover, so rapid is the growth at this time of the year, so fugitive the appearances presented, that unless the trees can be inspected on a particular day, some characteristics are lost till the next season. The gardener or the forester who is always on the spot, and who is, or who ought to be, always on the look out, has great advantages in these respects. A few illustrations may suffice to explain our meaning.

In Richmond Park there are two Horse Chestnuts side by side, now each in the full glory of their new leafage, and each covered with flower-buds promising an early display of bloom. The two trees are at this moment, to use a colloquialism, as like as two pins. The color and stage of growth of the foliage and flower are, in fact, alike in both. Far otherwise was it a fortnight or so ago, when the buds were beginning to expand; then, the two trees were conspicuous a long way off, the one with its ruddy brown color forming a contrast to the other with its clear green hue. The explanation of the difference was easily found in the circumstance, that the expanding bud-scales of the one tree were tipped with deep brown, or even flushed with pink, while those on the other tree were mostly green.

Again, the leaf-scales or stipules of some of the Beech-trees are of a lovely shade of crimson, while in others they are dull brown. It is, moreover, worthy of notice, that in the extension shoots, which lengthen rapidly and which bear leaves only, these stipules are often most brilliantly colored; whilst on the same tree, on the short, slow-growing "spurs" bearing the flowers, and where the internodes, as a botanist would say, are in consequence contracted, the color of the stipular scales is dull brown. These differences make one wonder what purpose can be served by the brilliant coloration of organs whose functions would seem to be protective only, and which, once that office is fulfilled, fall off and wither immediately. The color in these stipules is presumably of the same nature as that which gives brilliancy to the leaves of the Purple and Copper Beeches. A similar color is observable in the stipules of the Lime, but we have not yet met with any purple-leaved Lime-tree.

The chemical analysis of the bud-scales, as determined by Professor Church, is quite consonant with their temporary and merely protective character. They contain relatively much earthy mineral matter, but little or none of the organic

compounds which are the accompaniments, and, indeed, the instruments of life and activity.

Another color-phase is presented by the Hornbeam; when its male catkins are first produced slightly in advance of the leaves, the whole tree is covered with a sheet of a pale olive or fawn color, quite unlike any other arboreal tint familiar to us, and one which rapidly changes as the leaves expand; notice also the peculiar olive tint of the Lombardy Poplar at this season.

Of the peculiarities presented by the developing buds of the conifers we have spoken on previous occasions. It must suffice to say that they form objects of great beauty, interesting and suggestive subjects of investigation for the student, and often afford the forester means of distinguishing one species from another. Too implicit confidence, however, must not be placed on these characteristics, for, as we write, we have before us shoots of *Pinus cembra* taken from two plants growing side by side at Coombe Wood; in the one the bud-scales and shoots are pink, in the other green. Foresters and woodmen are familiar with many variations of this character which rarely come under the observation of the botanist, but which are often of practical importance, inasmuch as they are often associated with differences in the quality of the timber and the degree of hardihood of the tree.

The general course of leaf development varies somewhat according to season and individual peculiarity. This season, in the neighborhood of London, the Sycamore, Horse Chestnut, Thorn, Hornbeam, Lime and Birch have unfolded their leaves in the order named, whilst amongst the later trees may be mentioned Oak, Ash, Elm, Beech, Plane and Sweet Chestnut.—*Gardeners' Chronicle*.

The Art of Gardening—An Historical Sketch.

XXI. The Mahometans in India.

WHEN speaking of the more ancient inhabitants of India I said that their gardening art may well have been affected, at least to some small extent, by Persian influence, for this was certainly the case in many provinces with their architecture; and in my last chapter, where the advent of the Mahometan conquerors was noted, it was pointed out that their art was distinctly based upon the art of mediæval Persia. It is indeed most interesting to see in the Mogul remains of Hindustan the sign-manual of Saracenic taste—which means a mere development of mediæval Persian taste—set on every building and garden, and no sign of that "Tartar" taste which shows in the architecture of the Chinese, a race of the same Turanian blood as the Moguls. The great mosques of Delhi are purely Saracenic in outline and feature, although their details are naturally akin to those of the neighboring Hindu monuments since they were built for the Mogul rulers by local Hindu artisans.

In one important point, however, the Turanian origin of the Moguls is evident. All peoples of Turanian blood have been great tomb-builders, owing to that peculiar form of primitive religion which prescribed the worship of ancestors. Wherever a Turanian people has flourished—whether in recent times or as the far-off predecessor of other races who have since dispossessed it—there we find a temple more like a palace than like a sanctuary in the Aryan or Semitic sense, and a tomb more like a shrine or temple than a mere place of sepulchre.

So it was in India while the Moguls ruled. A change of faith had banished ancestry-worship, but the passion for splendid tombs persisted. The Mahometan religion required the building of stately mosques, and the luxurious temperament that had developed in the once rude and warlike tribes from central Asia demanded sumptuous palaces. But the royal tombs of Mogul India surpass both mosques and palaces in interest, and they show us something which we have not found in studying the art of Mahometans of Arabian or Moorish blood.*

Architecture and gardening went hand in hand under the Moguls as they had under the old Hindu rulers. The mosque and the palace were surrounded with ornamental grounds, while as the environment of the tomb they were of peculiar importance. The usual process, writes Fergusson,† when a Mogul prince wishes to provide himself with a tomb, is now, as it was in earlier centuries, "to enclose a garden outside the city walls, generally with high crenellated walls and with one or more splendid gateways; and in the centre of this he erects a square or octagonal building, crowned by a dome, and in the more splendid examples with smaller dome-roofed apartments on four of the sides or angles, the other four

being devoted to entrances. This building is generally situated on a lofty square terrace, from which radiate four broad alleys, generally with marble-paved canals ornamented with fountains; the angular spaces are planted with Cypresses and other evergreens and fruit-trees, making up one of the formal but beautiful gardens so characteristic of the East. During the life-time of the founder the central building is called a Barrah Durrie, or festal hall, and is used as a place of recreation and feasting by him and his friends. At his death its destination is changed—the founder's remains are interred beneath the central dome. Sometimes his favorite wife lies beside him; but more generally his family and relations are buried beneath collateral domes. When once used as a place of burial its vaults never again resound with festive mirth. The care of the building is handed over to priests and cadis, who gain a precarious subsistence by the sale of the fruits of the garden or the alms of those who come to visit the last resting-place of their friend or master. Perfect silence takes the place of festivity and mirth. The beauty of the surrounding objects combines with the repose of the place to produce an effect as graceful as it is appropriate."

The most famous and beautiful of these Mahometan garden-tombs of India is the Taje-Mehal, at Delhi, built for his favorite wife by Shah Jehan, who reigned from 1628 to 1658. Every traveler has described it, and the camera has made its aspect as familiar as that of the Parthenon or Notre Dame. Nevertheless, we can have no real idea how it looks, for, more than any other great building in the world, it depends for its charm upon the grouping of many different parts and the union of them all with the gardens. "If the Taje were only the tomb itself," says Fergusson, "it might be described; but the platform on which it stands, with its tall minarets, is a work of art in itself. Beyond this are two wings, one of which is a mosque which anywhere else would be considered an important building. This group of buildings forms one side of a garden-court 880 feet square; and beyond this again is an outer court, of the same width but only half the depth. This is entered by three gateways of its own, and contains in the centre of its inner wall the great gateway of the garden-court, a worthy pendant to the Taje itself. Beautiful as it is in itself, the Taje would lose half its charm if it stood alone. It is the combination of so many beauties and the perfect manner in which each is subordinated to the other that makes up a whole which never fails to impress even those who are most indifferent to the effect produced by architectural objects in general. . . . When used as a Barrah Durrie or pleasure palace it must have been the coolest and loveliest of garden retreats, and now that it is sacred to the dead it is the most graceful and impressive of the sepulchres of the world. . . . The long rows of Cypresses which line the marble paths that intersect the garden are now of venerable age, and, backed by masses of evergreen foliage, lend a charm to the whole which the founder and his children could hardly have realized. Each of the main avenues among these trees has a canal along its centre studded with marble fountains, and each vista leads to some beautiful architectural object."

The Taje is still in perfect preservation, but such is not the case with the palace at Delhi, likewise built by Shah Jehan, in which the famous peacock throne of Aurung-Zebe afterward stood, a marvel to the eyes of traveling Europeans. It formed an immense group of varied and beautiful buildings, arranged in a symmetrical, yet by no means monotonous way; and to the northward of it the gardens survive, formally disposed and filled with fountains and little pavilions and kiosks of white marble. Around the great hall of this palace was carried the famous inscription: "If there is a heaven on earth, it is this, it is this;" and even to-day, we are told, when the barbarous, "civilized" European has done much to ruin the beauty of the spot, the words sound none too boastfully. It is still approached from the town by a magnificent street nearly a mile in length with a stream of water running through the centre and rows of ancient trees on either hand.

There is no sign in these descriptions of that love for picturesqueness and variety which marks the pleasure-grounds of Granada. I should hesitate to say that none but strictly formal gardens were designed by the Moguls of India, for I have not been able to find any comprehensive account of their work in this direction. But it seems probable that a love for symmetry and regularity was stronger—or at least more universal—here than in Spain. A common religion bound the conquerors of the two countries together, and in each case we see an art which was based on Perso-Arabian precedents. But climate and landscape differed greatly, and the blood of the two races was unlike. At Granada the most typical building is a palace, at Delhi it is a tomb; if we examine the

*The Moors built no tombs in Spain, and though Saracenic sepulchres of importance exist in Persia, they cannot compare in magnificence with the Indian examples.

† "History of Indian and Eastern Architecture."

features of the two; we shall see a likeness in fundamentals, but a difference in details, and, so to say, in the general spirit of the work; this difference means a greater degree of regularity and sobriety in Delhi than in Granada; and I may say once more, as is the architecture so in every land are the gardens which accompany it. The likeness yet unlikeness of the gardens of the Moguls of Hindustan to those of the ancient inhabitants of the country on the one hand, and on the other to those of the Mahometan rulers of other countries, shows with clearness that the art of gardening, no less than its sister crafts, has a historical as well as a purely æsthetic significance.

In conclusion, I want to call attention again to the fact that among the Hindu remains of the Indian peninsula are some which show an even stronger feeling for wholly natural landscape effects than we find in Moorish Spain—approaches to rock hewn temples, for instance, composed of rough boulders and irregularly growing trees. So far as I can gather these instances are exceptional. But, however rare, they have their importance, as showing that the peninsula was akin in its mental characteristics to the further east as well as to the west—as forming a transition which leads us without a break from the classic gardens of Greece and Italy to the picturesque natural gardens of the Flowery Kingdom. *M. G. Van Rensselaer.*

Selenipedium caudatum, var. *Warscewiczii*.

THE noble specimen of this Orchid, which furnished the subject of the illustration on page 285, forms part of Mr. F. L. Ames' very rich collection at North Easton, Massachusetts. It is one of the most ornamental of the genus, both in its large, bold foliage, and in the handsome flower, which always strikes a person unfamiliar with the curious forms Orchid-flowers sometimes develop as one of the most remarkable objects in nature.

Selenipedium caudatum was first detected in Peru by the Spanish botanists, Ruiz & Pavon, more than a century ago, and it has been an inhabitant of European gardens for more than thirty years, having been introduced in a living state by Mr. William Lobb, who was a collector for the Veitchs, and who traveled extensively in South America, where he made many important discoveries. The variety *Warscewiczii* varies from the typical plant in the deeper and brighter color of its flowers, especially of the petals and the labellum. This variety was discovered by the Polish traveler whose name it commemorates, on the mountains of Chuquibambilla, in Central America, where, it appears, it grows "exclusively on the tops of the highest trees at sixty or one hundred feet or more above the ground."* It is often cultivated in gardens under the name of *Cypripedium caudatum roseum*, and is by far the handsomest of the group to which it belongs.

S. caudatum is remarkable for the long, ribbon-like, pendulous petals, which, when the flower first expands, are three or four inches long, but continue growing for about ten days, at the end of which they are sometimes two feet or more long. Veitch, in his manual of Orchidaceous plants, records the fact that, from the second to the seventh-day, they have been observed to have increased in length as much as two inches each day, and that flowers have been noticed in which the total length of the petals exceeded thirty inches. This plant is also remarkable for the large size of the flowers, the upper sepal being sometimes six or seven inches long, and for the handsome markings of the lip, which is bronze-green, with the enfolded lobes ivory white, spotted with purple inside the brown or yellow-brown border which surrounds the aperture.

We are indebted to Mr. William Robinson, who has charge of Mr. Ames' Orchids, for the following memorandum of cultivation employed to develop this fine specimen, which is probably the largest in the United States:

"To grow and flower this variety with success the temperature of a Cattleya-house is needed. It should be kept well up to the light, but at all times shaded from direct sunlight. A good time to repot is immediately after the flowering period, and the compost should consist of equal parts good, fibrous peat and live sphagnum moss well mixed with a sprinkling of broken charcoal. As the roots grow vigorously provision should be made for their development. The pot or pan should be proportioned to size of plant and condition of the roots, which, before potting, should be carefully examined, and all dead or decaying parts removed, with all exhausted material from the ball of the plant.

"A strong, vigorous plant does not require so much drainage as one in less healthy condition, but this is a matter which

should always be carefully attended to. Fill the pot from half to three-quarters full of clean, broken crocks, with a few pieces of charcoal, and keep the base of the plant at the level of the top of the pot, and with a hard pointed stick fill in the compost well and firmly among the roots. The plant loves moisture, and at no time should it be allowed to get dry at the roots, particularly during the growing season. Syringing overhead twice a day during the summer is none too often, provided the house can be well ventilated."

Foreign Correspondence.

Letter from Haarlem.

HAARLEM, the centre of the Dutch bulb trade, is not only favored with a genial climate, where extremities in heat during summer, or great cold in winter, very seldom occur, but it possesses a soil which can be adapted to the cultivation of plants from regions widely differing from it and from each other in climate and in the quality of their soils. Strangers are always surprised when told what plants can be induced to thrive with us on one and the same piece of ground. Thus luxuriant specimens of your American bog plants like *Cypripedium* and various moisture-loving Lilies can be shown within a few yards from such drought and sun-loving subjects as the groups of central Asiatic Irises are well known to be. I attribute this to the excellent method for which our Dutch government has long been famous in carefully regulating at all times the supply of water in our many canals and rivers, and to the nature of our light, porous, sandy soil, which, though barren and sunburnt its surface may appear during summer, always remains equally moist and cool a few inches below the upper soil. Now by shading and more or less deep planting an almost endless diversity of conditions can easily be made; bulbs which require a thorough roasting and basking in the summer's sun are only covered with one or two inches of soil, while *Sparaxis* and *Ixias*, for example, the bulbs of which are rather impatient of even a very moderate degree of freezing, are planted deeply and very late in the season. They are in this way obliged to make their underground growth during the winter months, and are thus prevented from pushing up their tender shoots too early in spring. By careful shading a degree of moisture can be provided for the plants not by any means equaling the quantities of water contained in an American swampy tract of land, it is true, but still just enough for the well-being of the respective plants.

One of the most striking examples of what I have just said may be found in the culture we so very successfully carry out of that group of Irises to which the botanic authorities have applied the collective heading of *Oncocyclus*, and of which the Mourning Iris (*I. Susiana*) is one of the oldest and best known representatives. Travelers tell us that the Irises belonging to this group are found in some of the world's most arid countries, where an excessive heat and drought reign in summer, while during winter a degree of cold is registered which we here in our moist Holland never experience. The ground in the countries where the Irises are found becomes covered with a thick sheet of snow early in winter, and under this natural cover the tender rhizomes are happily protected, until the warm rays of the suddenly returning spring melt in a few days the winter's snow and the tracts of land which only a few weeks before seemed shrouded in death become everywhere studded and crowded with the loveliest flowers imaginable. In Holland and the greater part of northwestern Europe, however, nothing can be more capricious than the ordinary winter's weather. January last the thermometer often went up to fifty and fifty-five degrees Fahrenheit, while in March it sunk as low as to ten degrees Fahrenheit. In consequence of this many bulbs which had appeared above ground in the course of January and February had their tops completely frozen off. This did not matter much to the greater part of the bulbs in general, but to Irises of the *Oncocyclus* group, had they not been specially treated, it would have caused an irreparable damage, if not absolute death. The method followed here to prevent these Irises from running into leaf-growth too early is the following: The rhizomes are not planted earlier than about the beginning of December, and as soon as freezing weather sets in a thick layer of reeds or leaves is applied in order to prevent the frost from penetrating into the soil. The plants are thus making their roots during the dangerous winter months, and the new growths do not appear above ground before the middle of April, when they can grow on without fear of any check.

Within the last few years some very beautiful species have been added to this group of Irises, *I. Gatesii* and *I. lupina*

* *Gardeners' Chronicle*, xx. (1883), 722.

taking the lead among them. Of *I. lupina* I have now several plants in full flower and I have no scruple in pronouncing them to be among the most striking of this section. The entire flower is of a greenish yellow color, delicately veined with brownish black, the centre of the lip marked with a very conspicuous black blotch. *Iris Gatesii* has flowers the shape of

dish brown on a yellow ground, and adorned with a very conspicuous deep brown eye in the centre. The crossing of this with *I. Susiana* has probably given birth to the forms known in gardens under the names of *I. Iberica*, *I. Van Houtteana*, *I. insignis*, *I. ochracea* and others.

Haarlem, Holland.

C. G. Van Tubergen.



Fig. 41.—*Selenipedium caudatum*, var. *Warscewiczii*.—See page 284.

I. Susiana, but of a larger size and of a peculiar silvery yellowish gray color. It has also the decided advantage of being much hardier than *I. Susiana*. Among older introduced species *I. paradoxa* well deserves the epithet of wonderful, no other Iris flower presenting the same singular combination of colors and exquisite shape. It is a native of the southern parts of the Caucasus, and although it has long been in cultivation it is still extremely rare in European gardens. The standard segments of the flowers of *I. Iberica*, which may without exaggeration be called gigantic in comparison with the miniature size of the plant, are of a silvery white color only just perceptibly veined with a delicate lilac; the falls are very large, marked with red-

Cultural Department.

Notes on Shrubs.

WHEREVER the native Redbud Judas-tree (*Cercis Canadensis*) and the Chinese species (*C. Chinensis*, or *C. Japonica*, as it is sometimes called) are equally hardy under all circumstances, there can be no hesitation in selecting the exotic species as the finest of the two when in bloom. The flowers are about twice the size of those of our native species, and are produced in fully as great profusion, and the color is of a finer deep reddish purple. But unfortunately the introduced species has not yet proved hardy enough in Massachusetts

to encourage many attempts to cultivate it. However, there are plants about Boston, in exceptionally favorable situations, which have become good bushes, from eight to ten feet high, and annually produce an abundant crop of blossoms, which first open about the same time as those of our native species, usually between the 10th and 15th of May. Although *C. Canadensis* is not found growing wild in New England, it is perfectly hardy when grown from seed from its northern limits in Pennsylvania or Michigan, and it is possible that the Chinese species may prove equally enduring if grown from seed from its extreme northern range in China or Japan. When planted against a background of evergreens, or among the white flowering Crab-apples, which bloom at the same time, the leafless, flower-covered branches of the Redbud make a striking and beautiful effect.

The Redbuds are among the earliest woody plants of the Pea family to flower, but they find their contemporaries in the bright yellow-flowered Siberian Caraganas or Pea-trees (*Caragana arborescens* and *C. frutescens*). The first of these sometimes attains the size of a small tree. The pinnate, light-green, downy leaves are well expanded when the solitary short stemmed yellow flowers appear, so that the blossoms are not nearly so conspicuous as those of the Redbud, but they continue a little later in bloom. There are several described natural varieties and horticultural forms of *C. arborescens*, which differ chiefly in habit of growth or size of flowers, foliage, etc., but they do not present variation enough to make it worth while to grow them in a small garden. *C. frutescens* differs chiefly in being much more shrubby and slender in habit, and having only two pairs of leaflets, which are crowded at the end of the leaf-stalk. The early fruiting of these two species testifies to their adaptation to the short summers of the northern countries where they grow. The pods ripen about the end of the first week of July, and within a few days after maturity they burst open and scatter the small dark brown peas, which swell and germinate at once if they come in contact with moist soil. *C. Chamlagu* is a small shrub, of Chinese origin, which has slender branches, and large yellow flowers, which become reddish as they get old. It does not appear to be a very profuse flowering plant in this latitude, and it is not nearly as hardy as the preceding species. *C. Altagana* is a slender, graceful little plant, with very small leaves, having the general appearance of a miniature form of *C. arborescens*.

Nearly all of the Caraganas possess more or less developed stipular spines at the bases of the leaves. In most of the species they are short, but in *C. jubata* they are long and slender, and in *C. spinosa* they seem to reach the greatest length and sharpness. On the last species they are from one to two inches in length, and, though slender, are remarkably rigid, and capable of penetration. Being a native of Siberia and northern China, the plant is quite hardy. The flowers are yellow, as in almost all species of the genus. The leaves and branchlets are covered with a grayish down, and as the long spines extend far beyond the foliage, they give the whole plant an ashy colored appearance which is more curious than ornamental.

Arnold Arboretum.

J. G. J.

Fern Notes.

A VERY useful arrangement of Ferns may be made and a beautiful effect produced by planting out a number of species on a bench, a rock-work or other suitable place, and in this way, too, an abundant supply of fronds can be secured for cut-flower work. This last is an important item in most places, and by the adoption of the above system a larger and better supply may be had from a given space than if the plants were grown in pots. This has been abundantly proved in commercial establishments where the growing of Fern fronds for the market is now a special feature, though largely confined to a single species, *Adiantum cuneatum*, which is grown by tens of thousands for this purpose. But on many private places the amount of space available for such a purpose is quite limited, and consequently a variety of fronds will be found more useful. At the same time this particular Maiden-hair Fern must be placed at the head of the list as the most generally useful Fern now in cultivation, and this being the case, of course a larger proportion of this species should be planted than of either of the others hereafter named.

A. gracillimum is also good, its finely divided pinnæ being so graceful and filmy in appearance as to excite the warmest admiration when used among certain flowers. *A. Wiegandii*, a garden variety of American origin, is also an excellent sort for cutting, the fronds being of medium size, and when well matured lasting for several days in water. *A. Williamsii* and

A. hispidulum are also to be classed among the useful Maiden-hairs, both being very effective and having lasting qualities.

Onychium Japonicum should be included in the list, its slender, light green fronds being quite durable.

Several members of the *Pteris* family should have a prominent place, being among the most free-growing and easiest raised of Ferns. Their seedlings appear in almost all directions in a house that has been used for these plants for a few months. Probably the best of the *Pteris* for cutting are to be found among the varieties of *P. Cretica* and *P. serrulata*; *P. Cretica magnifica*, *P. Cretica albo-lineata*, *P. serrulata* and *P. serrulata cristata* being among the best. If the space at hand will permit, some of the larger sorts should be added, such as *P. tremula*, *P. argyræa* and *P. semi-pinnata*, as foliage of this description is very useful in large decorations.

Some of the *Nephrolepis* should also find a place, their long, graceful fronds being especially elegant when tastefully used among well-grouped flowers. *N. davallioides furcans*, *N. rufescens tripinnatifida* and *N. pectinata* are notably good, while the whole genus is pretty.

Davallia tenuifolia stricta and *Nephrodium otarium* (otherwise known as *Lastrea aristata variegata*) are also good Ferns for this purpose, though the last named is rather slower in growth than the preceding.

This short list may serve as a basis for an operation of this character, though numerous additions will soon suggest themselves to the interested cultivator.

The treatment to be given is very simple, the usual method being to fill a bench to the depth of five or six inches with soil—a light loam will answer, or, if the soil is inclined to be clayey, a third part of peat may be added and also some sand. It is best that the soil be not made too light by the addition of much peat, else the fronds are likely to be too soft for cutting, and in filling up the bench, of course, proper provision should be made for drainage; and, while a reasonable degree of shade is necessary, yet the house should not be made as dark as some Fern-houses are, or the result will be soft, flabby fronds, that wither almost as soon as they are cut.

Young, vigorous plants, from three or four inch pots, will be found most satisfactory, and, if planted out now, will soon become established and will furnish a large number of fronds during the following autumn and winter if planted in a house in which a temperature of fifty to fifty-five degrees is maintained.

Probably the most troublesome pest to which these plants are exposed is that of slugs and snails, by which the young fronds are eaten off as they appear; and an easy way to obviate this difficulty is by laying some leaves of cabbage or lettuce on the soil, and by the examination of these leaves in the morning and evening many such vermin may be destroyed.

Holmesburg, Pa.

W. H. Taplin.

Some American Plants.

ONE of the prettiest *Brodiaëas* we have seen came from Oregon under the name of *B. Hendersoni*. Its flowers, six to twelve, are in an umbel three-quarters of an inch wide, creamy white with a yellowish centre. A prominent dark purple stripe runs the whole length of the sepals both outside and inside. The leaves are from the base, long and narrow, and the naked stem is about a foot high. It would be useful for cutting.

Another showy little plant is the *Allium serratum*, from California. It is about ten inches high, with a naked stem and a many flowered umbel of rose-purple flowers half an inch wide. Like our *A. tricoccum* the leaves die down at time of blooming, leaving only the flower-stalk visible. It may not be hardy. Ours were covered with leaves during winter.

Calochortus pulchellus, now in bloom, has pretty nodding yellow flowers an inch wide, on short stems. The plant is low, only four to six inches high, bearing in succession two to five flowers. It is not suitable for bouquets, but is well worth growing as a garden plant. It probably needs protection in winter.

Zygadenus elegans, one of the Lily family, is a rare plant occasionally found along the northern portion of the United States from New York to Oregon, and along the St. Lawrence River to the Gulf. It varies much in height. Our plants from Oregon are only a foot high, but we have seen it on the lower St. Lawrence much taller. Its leaves are long and grass-like from the bulbous root. The naked stem bears a single panicle of from eight to fifteen erect white flowers, with a greenish yellow centre, three-fourths of an inch wide. It is pretty and useful for cutting, hardy, too, and should become better known in cultivation.

The common Wild Lupine (*Lupinus perennis*) is a very



American Elm-tree at Sandwich, New Hampshire, 100 years old.—See page 281.

pretty plant in flower. Its loose spikes of pale blue and purple flowers of various shades are often more than a foot in length by an inch and a half thick, on stems long enough for cutting. It is very common in some localities, growing luxuriantly in the poorest sandy soil—a desirable perennial a foot and a half high.

The little Star Grass (*Hypoxis erecta*) makes a pretty border plant, and grows much stronger in cultivation. Its narrow leaves are a third taller than its flowering stems. The numerous bright yellow flowers are three-fourths of an inch wide. It will grow in shade or sun, and is perfectly hardy.

Cynthia Virginica, a plant of the Dandelion family, is a foot and a half high, bearing on long, almost naked stems, two to five yellow flowers an inch wide, which closely resemble those of small Dandelions. They open in the warmest part of the day and close at night. The most of its leaves are at the base of the plant. It is found on moist banks in New York State and westward. It is easily cultivated, and may be grown in a thin shade or open sunlight.

Claytonia parviflora, though of the same genus as the Spring Beauties, is an Oregon species and flowers much later. Indeed, both of our species (*C. Virginica* and *C. Caroliniana*) have usually nearly died down before this begins to flower. Its flowers, however, much resemble those of its eastern relatives, but are a trifle paler, and are more numerous, on longer stems, and come from a tufted root, while ours are both from small tubers. It is a hardy plant, forming dense beds, and when in full bloom displays almost a solid mass of pale pink flowers. It needs a thin shade.

Baptisia leucophæa (False Indigo) is an interesting plant of the Pulse family. Its height is about a foot, and its divergent branches make it broader than it is tall. Its long drooping racemes of cream-colored flowers are very pretty. These racemes are often a foot in length, and each flower raised on a long pedicel is itself nearly an inch in length. It is a native of the western states, and should have a light soil in open sunlight.

Geranium maculatum (Wild Crane's-bill) and *G. Robertianum* (Herb Robert), two common eastern species, are in flower. The former is a much taller plant, with light purple flowers three-fourths of an inch wide, quite pretty, but not very durable, on ample stems for cutting. The latter is a strong-scented plant, scarcely half as high, with smaller red-purple flowers, which appear from the last of May until the middle of autumn. It is a pretty plant for rockeries. Both species like shade.

Geranium incisum, from Oregon, is also a pretty species, with rose-purple flowers, with darker stripes, an inch wide. The plant is usually about a foot high, is hardy, and well worth growing.

Southwick, Mass.

F. H. Horsford.

Hardy Plants for Cut Flowers.

THE Japan Anemones are usually classed among hardy perennials, though they are not reliably hardy in all sections. Even when covered in the open ground the strong flowering buds often get killed during severe winters, and by far the best plan is to lift the roots after the foliage has been killed by frost, and place them in boxes of soil in a cool cellar until spring, when they may be replanted in well-enriched soil. During dry weather the plants should be abundantly supplied with water, and they will be very different from the specimens of this queen of autumn blooming plants which are too often seen in our gardens. The type is the earliest to flower, and has bright, rose colored, semi-double flowers, which are very bright and pleasing, but the habit of the plant is poor in comparison to the pure white form known as Honorine Joubert, which is the best and most useful. The variety *hybrida* has pink flowers, and the three make a very interesting group for the flower border, and if a plant or two of *Aconitum autumnale* be planted with the Anemones it will give a beautiful dark panicle of flowers at the same time, and a group of these plants will be sure to attract attention in September and October. When lifting the Anemones, if it is desired to increase the stock (and one feels that it is hardly possible to have too much), the smaller fibrous roots may be carefully lifted and potted up, and if kept in a greenhouse during winter and grown on they will flower well the next fall.

During a favorable season the *Aconitum* ripens seed in fall, and this germinates readily if sown as soon as gathered, in striking contrast to imported seed of this genus. A collection of seventeen kinds of these foreign seeds was sown at the same time last fall, but not one of the seeds germinated. It should be remarked that *Aconitum autumnale* is perfectly hardy, and is better without protection, as this induces it to grow early in spring, when late frosts are still prevalent.

The Sunflowers are a beautiful genus, and nearly all the perennials are late summer blooming plants. *Helianthus multiflorus* is the one most common in gardens, especially the double variety; it only needs liberal treatment to bring an abundance of useful flowers in fall. It must be admitted that, though often called hardy, this is not absolutely true, and it is best to lift an old root and place in the cellar with the Tritomas, Anemones, Gladiolus, Dahlias, and such plants, that are indispensable, though tender. *H. angustifolius* is an elegant species, growing about four feet high, with much-branched flower-stems and deep green, shining leaves, and produces an abundance of flowers similar to those of *Coreopsis* and quite as useful for cutting. A colony of this plant is admirable in any place where it may be planted and left alone to take care of itself, as it seeds freely and soon becomes naturalized, and though old plants are liable to perish in winter the young ones are ready to take their places. *H. orgyalis* and *H. Maximiliani* are two species that flower late, grow tall, have graceful foliage, and may be used for cutting when few other flowers except Asters are to be found. They are both strong growers and need plenty of rich material to feed on, and this may be applied to the best advantage if the plants are lifted early in spring and replanted at once. This little trouble will be amply repaid by the vigorous growth the plants make, especially as the foliage is so pretty all the summer as a background to other plants that they are worth growing for this alone.

It is scarcely necessary to say anything about *Coreopsis lanceolata* except, perhaps, that it is the best hardy yellow Composite grown, and no one with a garden can afford to be without it, and, indeed, never will if it is once planted; for it seeds so freely and the birds are so fond of the ripe seed that wherever the *Coreopsis* is grown it is sure to become naturalized, as we have often seen it among long grass, in fields, near gardens where plants were growing. Last summer we attempted to gather seed, but the birds captured the lion's share in spite of all precautions. *Coreopsis tripteris* should have been classed with *Helianthus orgyalis*, it grows so tall. It has graceful foliage, and very fragrant flowers, which smell like the English Wallflower, and they are acceptable for house decoration in the latter part of September.

Reading, Mass.

E. O. Orpet.

Papaver lævigatum.—Another season's trial of this variety confirms the favorable impression formed on its introduction last year. It is now profusely in bloom on some self-sown seedlings. The flowers are cupped, some four inches in diameter and of a very deep rich crimson, or, perhaps, blood-red, with black blotches on each petal; and it is with some satisfaction to be noted that they hold their own against the flaunting Oriental Poppies. The latter, with their beautiful Acanthus-like foliage and noble flowers, are among the best of herbaceous plants, but the vivid orange-scarlet flowers fairly overpower most other blooms in a garden, and care is necessary in planting them, so that they are far removed from any blue-reds especially, as the contrast is hideous. The new rose colored form will be valuable, as it might be planted in positions where the type would be inadmissible. Nature has favored us with entirely too many "blue-reds," as a collector of hardy plants discovers, especially among Phloxes, Pæonies, Aubrietias, Pyrethrums and Primulas, and great care should be exercised in planting these in a general collection where the orange-reds are in the same field of vision. Colors appear so differently to various observers that it is difficult to say which may not be pleasing to the average grower, but it would seem that the washed-out blue-reds might be banished from every garden. The deeper color, the rosy purple of the florists, is, perhaps, more admissible, but not satisfactory to every one.

Ornithogalum Arabicum is an old inhabitant of gardens, but until lately it has been comparatively little grown. It is often called Star of Bethlehem, although this name is properly applied to *O. umbellatum*. The flowers now in bloom in the open are very attractive, forming clusters of a dozen on long peduncles. Separately, they are about two inches in diameter, pure white, with a curious black ball-like eye. The bulbs, which may be secured in the fall, are not quite hardy with me, but, potted up, are kept in the cold frame and plunged in the open on the approach of warm weather. The bulbs have been sold largely for forcing, but, judging from some results seen, they do not seem reliable for that purpose. *O. nutans* is a somewhat striking contrast to above, being hardy and prolific of increase. The flowers of this variety are green, striped white, star-shaped, and bloom in a loose raceme. It comes very rapidly into bloom in the first warm days of April, and the flowers are rather fugacious, opening first on the lower part of the scape. It is a native of southern Europe, and has lately been found in Asia Minor.

Columbines are scarcely exceeded in grace and beauty by any family of hardy plants, and it is almost superfluous to dwell on their value for small and large gardens. From the earliest, *Aquilegia Sibirica*, to the latest, *A. chrysantha*, there is a long season of bloom, and in most soils the plants are long-lived. They naturalize well in semi-wild places, and even hold their own in not too dense grass. While the blooms are not very lasting, they are good as cut flowers for a couple of days. Cut with long stems, and with their foliage arranged at the base, they make graceful bouquets. Stock is readily increased from seed, from which they bloom the second year. If special varieties are desired, seed should be secured from very reliable source, as the flowers are very attractive to insects, and it is impossible to secure reliable seed where varieties are cultivated together. Where one is not very particular a German "assortment" such as is offered by the seedsmen will produce an endless variety.

Aquilegia dichlora, from Portugal, is now in bloom. As its name implies, this is a two-colored variety, the sepals being a turbid light purple, with white-tipped petals; flowers medium size and spurs about one inch long. The plant is about two feet high; foliage small and triternate. This variety is not sufficiently attractive for ordinary garden purposes.

Aquilegia alba grandiflora, Munstead variety, is a fine dwarf growing White Columbine, with charming cream-white flowers of a rather delicate texture. Spurs are an inch long and foliage light green and attractive.

Elizabeth, N. J.

G.

Sowing Seed.—Seeds of herbaceous Calceolarias, Cinerarias and Chinese Primulas should be sown at once thinly on fine soil, and not covered with soil. A good way to treat these seeds and seedlings in the summer-time is to select a north-eastern exposure under the lee of a building where a small platform can be erected about a foot from the ground. In this the seed-boxes are set. These are covered over with paper first, over which panes of glass are placed, and over all is a glass roof made of ordinary hot bed sash. This gives control of light, air and moisture at all times.

Ten Weeks Stocks.—At this moment I have a fine display of these most beautiful and deliciously scented flowers. The seed was sown on March 15th; when large enough the plants were pricked out in boxes one and one-half inches apart, transferred to cold frames and on the first week in May they were planted fifteen inches apart in soil that was well manured last year for potatoes. In transplanting, none but those showing double flowers were planted. The colors are red, white, purple, and a buff or chamois shade. They are from twelve to eighteen inches high, with several spikes to each plant. *Gladiolus* will be planted among the Stocks about the 15th of June so as to keep the bed occupied.

Pearl River, N. Y.

John Thorpe.

Correspondence.

The Fruit Outlook.

To the Editor of GARDEN AND FOREST:

Sir.—The crop predictions now current in the papers are generally most flattering. The business prospects of the country are cheering, the farmers and fruit-growers are congratulated on the promise of a bountiful harvest. The motives behind these inspiring forecasts are various, but they do not, as a rule, emanate from practical farmers themselves. It is a common practice among superficial observers to conclude that an abundant bloom is a sure forerunner of a bountiful crop. I have heard several persons remark this season on the full bloom of fruit trees, that it was bearing year, and there would be a full crop of all fruits except peaches. But the practical cultivator, while he knows that blossoms must precede fruit, also knows that these appearances are often deceitful.

There is probably no fruit crop so subject to the caprices of temperature and climate as the Peach. The mild, late fall of last year sent the trees into winter quarters full of fruit buds, but winter was a continuation of autumn. This mild and genial weather aroused the dormant buds and caused them to swell beyond their ability to withstand a low temperature. Peach-blossoms in December and January are not calculated to stand severe weather, and when these were met by the cold waves in the Carolinas and Virginia they were an easy prey, and the swelled, though unopened buds in Maryland and Delaware were largely killed. The fact that a few buds escaped on some of the late varieties was due to their more dormant condition, probably, than to their more hardy nature. When I announced the loss of the crop here I was told that the condi-

tion of things was probably not as bad as I thought, and there would be more peaches than expected. Since then these confiding ones have changed their views, and have concluded to do without peaches this year.

Of the other standard fruits the bloom was unusually abundant, never more so; some trees were complete masses of flowers, with hardly a green leaf visible. Years of observation have taught me that superabundant blossoms are not sure indications of a full crop of fruit, but on the contrary quite often result in a light crop. Ordinarily if one blossom in ten sets a fruit that arrives at maturity the crop will be abundant. This season, if one blossom out of a thousand produces fruit I shall be disappointed. The cause or causes that are responsible for such unexpected results are not altogether clear.

Possibly the trees in attempting to produce an extraordinary amount of pollen have had their ability overtaxed so as to be unable to impart to it the vigor necessary for the effective fertilization. An excess of moisture in the form of rain or fog will also seriously interfere with this work. I think, however, a low temperature is a more potent agency in preventing fructification than is generally suspected, and is really the responsible factor even if the atmosphere is clear and dry and bees are as active in making their accustomed visits.

It is to this cause, perhaps, that we owe the loss of our fruits this season; at all events fruit-growers in this part of New Jersey need not study the markets as sellers or count on much income from their Apple, Pear or Cherry crop.

Of the small fruits Currants are about half set. Strawberries promise well for a full crop now. Grapes are not yet in bloom here, hence it is too early to speculate in regard to them, and both Strawberries and Grapes have yet to incur the chances of attacks by insects and fungi. These fictitious forecasts are detrimental to the producer and consumer alike as far as their influence extends, and their publication ought to be discouraged. An honest, truthful statement of the condition of crops as they develop, rather than speculative theories in advance, would be far better for all concerned.

Montclair, N. J.

E. Williams.

The American Association of Nurserymen.

Fifteenth Annual Meeting.

THIS meeting was held in the hall of the Park Avenue Hotel, in this city, and its sessions occupied three days last week. About two hundred members were in attendance, and all sections of the country were represented. An admirable programme had been prepared by the Secretary, Mr. Charles A. Green, of Rochester, and carefully written papers were followed by animated and instructive discussion. The President, Mr. G. A. Sweet, of Dansville, New York, took a somewhat discouraging view of the immediate prospects of the nursery business, and he declared that no other industry employing the same capital and labor has been so poorly paid during the last fifteen years. The individual members, however, did not seem to be in a gloomy frame of mind, and altogether one rarely sees a representative body of business men whose appearance indicates greater prosperity. Mr. Sweet himself seemed to express the general sentiment when he said later that while the large profits which came to a new business in a new country can no longer be realized, there is no reason why the nursery business should not stand abreast of other legitimate industries and realize a fair return for capital and labor invested. The hope was expressed that since the Association had accomplished so much in securing equitable rates for freight, expressage and postage, something further might be accomplished in the way of combination against adventurers who demoralized the market by planting for temporary speculation. Mr. Sweet wisely added that it was for the interest of nurserymen to help on every movement which opened new markets for fruit, new appliances for safe transportation and new processes for preserving fruits, as well as to encourage the production of new varieties of fruit which would prolong the season, and to aid in increasing the general knowledge of trees and shrubs, and promoting the public taste for ornamental planting.

Among the subjects considered was the method of securing to the originators of new fruits and plants some

certain reward for their labors. The plan of a National Plant Register, as developed by Mr. A. L. Bancroft, of San Francisco, was considered too cumbersome, but some mode of registering new plants seemed desirable and a committee was appointed to consider the subject. Some of the members explained that they already used trademarks under existing laws, and that this practice protected them to a great extent.

We give abstracts of some of the addresses, and these will be continued next week.

GRAPES AS AFFECTED BY CLIMATE AND SITUATION.

This was the subject of a paper by Mr. George W. Campbell, of Delaware, Ohio, well known as the introducer of the Delaware Grape. The greater portion of the essay is herewith given.

The widely differing opinions upon the character and value of our most popular Grapes seem at first sight unaccountable. And although much may be due to the diversities of individual taste, the different estimates upon many of our Grapes from different sections of the country can hardly be satisfactorily referred to this cause alone. I have in mind the conflicting reports which I have seen upon the southern seedlings of the Riparia class—mostly from the Taylor and Elvira—which was introduced from Missouri with high commendation. Also upon the so-called hybrid varieties of Messrs. Rogers, Ricketts, Moore and others. I may also include special varieties of more recent date; notably Niagara, Empire State and Pocklington; as well as Brighton, Eaton, Woodruff Red, to say nothing of many more of less prominence.

Within my own experience, all the Riparia seedlings, such as Elvira, Missouri Riesling, Grein's Golden, and several others known by numbers, with Faith, Amber and Noah, have failed, in my locality, to meet expectations. While their habits of growth, hardiness, health and productiveness are generally good, they are decidedly wanting in the quality to render them acceptable for general use. Still, I do not feel warranted in saying that because this is my experience the same varieties may not be, in their native home, under the more genial influences of a southern sun, all that their introducers claimed, and valuable acquisitions to their list of native Grapes.

The various reports which we have of the Pocklington, Empire State and Niagara indicate to me simply this—that in some places and under favorable circumstances they are successfully grown and valuable—while in others, to which they are not adapted, or from some unfortunate surroundings, they are not. During the past season, in my reading of one day, I saw reports upon the Pocklington from two different sources—one praising it as a Grape of remarkable excellence, the other finding it so poor that he wanted to prosecute the nurseryman who sold it to him for a fraud.

Nearly as diverse have been the reports upon the Empire State. In some places it has apparently sustained the high character claimed by its introducers, in others it is reported to have failed both in the health and hardiness of the vine and in the quality of its fruit. In my locality the Empire State has been healthy in foliage, vigorous in growth, and—excepting in the past season, when it failed to ripen perfectly—the finest in quality and flavor of any white Grape I grow. In this instance the vines were probably allowed to overbear, and a cool, rainy autumn prevented their maturity.

The Niagara has sustained itself fairly well—though it will not endure our severe winters without protection. It is not as early as was represented—unless it is gathered long before it is ripe and while it is both immature and foxy—but if left upon the vine until well ripened it is a really good grape, retaining but little of the foxy taste or odor. My experience with the Niagara indicates that in localities to which it is adapted it will prove a valuable and profitable variety. The same remarks will apply to the Woodruff Red, except that the latter has proven, so far as tested, healthy in fruit and foliage, and entirely hardy in our severest winters. I still regard the Woodruff as probably the most promising red Grape for general planting yet introduced.

Of Mr. Rogers' many varieties, I will mention but one as bearing upon the points I wish to illustrate. His Number One or Goethe was introduced as a light or amber-colored Grape; and in Massachusetts, I presume, it rarely attains a deeper color. At Delaware, where I have grown it for more than thirty years, it sometimes obtains a light red or pink shade; but was always flavorless and insipid, with the exception of a single instance, when the autumn was unusually warm, and the ripening season prolonged until about the middle of October. It then attained a color as dark as the Delaware and a high flavor and good quality hitherto unknown,

thus showing that farther south, where the skies are brighter and the seasons longer, it might be a valuable Grape. This, I believe, is just what many of our southern growers find it; and the Elvira, with its kindred varieties and seedlings, are no doubt equally improved under the same favorable conditions.

Mr. Ricketts' Grapes, although many of them, as grown and exhibited by himself, were of great beauty and excellence, have not proven generally successful, and the most of them, I think, can only be grown to perfection by special care or in very favorable situations. The Jefferson has been with me one of the most successful, and among the best flavored, though sometimes rather tardy in ripening. John Snider, one of the oldest Grape-growers in southern Ohio, at Lancaster, gives the Jefferson the position of "the finest grape on the American Continent." But Secretary Williams, of New Jersey, finds the Jefferson unsatisfactory and of little or no value.

The Brighton Grape is deservedly popular in many places, but it often fails in productiveness. This must always continue, for the cause is found in its imperfect blossom, with short filaments and reflexed stamens. In favorable seasons, with bright and mild weather during the period of inflorescence, the pollen seems sufficient to fertilize and produce perfect fruit. But if cold and rainy weather prevails at this period the grapes fail to set, and few and imperfect clusters are the result. Some of the Rogers' Hybrids and the newly-introduced Moyer Grape are in the same class.

Most persons who plant a large number of different kinds of Grapes come to the conclusion that we have too many varieties. This is doubtless true as applied to any one locality; but the very kinds that do not succeed in that particular situation may be both successful and valuable in other places which are suited to their special requirements. Many of us have doubtless observed that occasionally, when we have pleasant and sunny weather extending late into autumn without unseasonable frosts or cold rains, some of the Grapes of southern origin, such as Catawba and Herbemont, and even our northern Clinton and Zoe, become rich and high flavored with a sweetness and refreshing sprightliness which are only attained in our climate in exceptionally favorable seasons, or on southern walls, or in sheltered and protected situations where they have artificially the climate and the surroundings which their origin and their nature require. The inference here is plain that in other places where such favorable conditions exist naturally the same happy results will as naturally follow.

I have probably said enough to indicate the point I wish to make: that success in Grape culture requires that varieties should be selected which are specially adapted to the locality where they are grown; and that because a Grape does not succeed in one section, it is by no means certain that it may not be both successful and valuable in another to which it is fitted naturally. I regard this matter of adaptation as one of the most important to be considered by the practical Grape-grower.

The area of adaptation is evidently much wider for some varieties than others. In our section of country the Labrusca type—including Concord, Worden, Moore's Early, Ives, Lady Martha and Woodruff—will probably be found more generally successful than any other class; but there are, doubtless, in some portions of the south, other varieties which are better adapted to their soil and climate than any of these. The Delaware Grape would probably be found adapted to as large an area as any other in cultivation, except for its unfortunate liability to mildew of the foliage; and I am not without hope that the use of the sulphate of copper remedies may so far overcome this difficulty as to permit the successful growing of this valuable variety to an extent even beyond that of the Concord by reason of its constitutional resistance to the attacks of Grape-rot.

I regard as of the greatest importance the use of these recently discovered remedies against the various maladies which have been so prevalent and so discouraging to Grape-growers. I believe that their general adoption and general use will not only greatly enlarge the area of successful Grape-growing, but will also enable us to grow profitably many of the finer and partially tender varieties in sections where it would be impossible without them.

SUCCESS WITH PEACHES.

Mr. J. H. Hale gave his experience in growing Peaches north of what is generally considered the Peach region—his home being in central Connecticut. He had observed that on high hills seedling Peach-trees lived and flourished, while trees in the valleys, which were cultivated, almost invariably, were killed in the winter or had their buds killed so as to destroy all hope of fruit. He, therefore, began an experiment in a small way, and planted some peach-pits from Tennessee.

He started his orchard on the high hills, taking pains that the ground should slope away rapidly, because he had observed that the cold air flowed down into the valley as rapidly as water would; never planting his trees on elevated plateaus, but on the steep ridges. He took pains to cultivate the soil thoroughly, and, having seen that in the neighborhood, trees which stood in land which had been enriched heavily with stable manure were short lived, he determined to make a trial of commercial fertilizers. He began to plant on thin land, using different kinds of chemical fertilizers, until he found that wherever he used potash and bone-dust his trees did well. He used no nitrogenous fertilizers except the little which was found in the bone, for he discovered that the trees which were fertilized with nitrogen, although they made a rank growth, died young. Six years ago his orchard had grown to fifty-two acres in a region where the mercury sometimes descends to twenty degrees below zero.

He prunes closely, and prunes so as to assist in thinning the fruit; that is, he does not begin to use the knife until after the trees have bloomed and begun to set their fruit, but he also thins very thoroughly afterward. In one orchard last year, after having thinned the fruit to one-half, he set men to work with orders to pick four peaches to every one they left, and as a result he had nothing but fine, large fruit. He took care to see that the fruit was picked carefully, and since his market was near by, every peach was allowed to mature fully. The peaches were very carefully assorted by women of taste and judgment, and among the first quality nothing but the very select and large and perfect fruit was gathered and carefully packed in new baskets made of white poplar, and pains were taken to have every peach from bottom to top of the same quality, with a label and guarantee to this effect, and then he asked a dollar more a basket than other sellers asked for fruit that looked as well on the top as his. Last year he picked 17,000 baskets. The best sold at wholesale from \$2.50 to \$3.50 a basket, the second grade at \$1.65 to \$2.25, and so on down to the lowest quality, and he received for his entire crop \$25,000.

Mr. Hale was asked whether his success had not ruined his neighbors, and he replied that, to the best of his belief, at least 100,000 Peach-trees had been sold in Connecticut this year, and although every one was guaranteed to be of the same sort as those that Hale planted, he suspects that 90,000 of them will die and very few of the rest will yield paying crops. He observed that so long as he bought trees from other dealers he found some trees of the wrong sort mixed in the row; and as they came from honest growers, he concluded that the mistake arose from propagating from trees which were standing in the nursery rows. In this way errors were perpetuated. If buds were invariably taken from bearing trees there could be no mistake.

THE VALUE OF PIECE-ROOT GRAFTING AS COMPARED WITH CROWN GRAFTING AND BUDDING.

Professor L. H. Bailey, of Cornell University, said that in no country but our own is nursery stock largely propagated by piece-root grafting. The advantages of this method are, that more trees can be made from a given stock; that it cheapens the multiplication of trees; that a given number of trees can be produced more quickly; that, with deep planting, cions of hardy stock will throw out roots of their own and preserve a tree even if the original root was tender. Of course, all varieties, when grafted, do not root equally well, but it is possible in this way to get what are practically own-rooted trees, for example, of the Chicasa Plum when grafted on the Peach. In this way piece-roots are good for temporary stock, as when the Quince is grafted on the Apple. Besides this, it enables us to grow rare plants of which we have no seeds or cuttings. What seem to be some disadvantages of this form of grafting are that the roots always grow more pronged and not so deep; fewer fine roots are thrown out, and most of them start on one side; trees from such stock (it is said) are more liable to blow over, and Professor Bailey cited as examples two contiguous orchards, one of crown grafted trees and the other of trees from root-grafts, in which it seemed clear that the latter needed staking more firmly in order to keep them upright. As a rule, root-grafted trees make a smaller growth, and Professor Bailey exhibited some photographs which seem to show that two-year-old budded trees were as large as three-year-old root-grafted trees. Professor Bailey explained, however, that these pictures were not conclusive evidence, since they were not grown by the same persons and for several other reasons. Again, root-grafted trees tend to be more crotched and straggly in the top. It is also said that they are not so long lived.

The advantages of crown grafting on whole roots or budding are that larger trees with deeper and more symmetrical roots are secured; that the young trees have greater force behind them in a more perfect root system so that they are more vigorous and growthy. It is argued also that the crown is the best place to graft because it has a more dense tissue than the root and probably therefore will make a more perfect union.

Mr. Albaugh, of Ohio, enforced the views of Professor Bailey by saying that in the experience of his company, which is very large, they have lately succeeded in getting more and better trees from crown grafts, so that they think the method is preferable both for the nurseryman and planter. At all events they never have any block of trees failing utterly, as they formerly did when they used root grafts.

A nurseryman from Nebraska declared that the question was a sectional one; that in the east, where a very strong growth was needed, whole roots were the best, but in the deep, rich soil of the west these long, strong growths failed to ripen up, and in consequence winter killed. Therefore, root grafting was the best in the west because such plants only grew to a moderate size and ripened well to the tip. He also never had found any lack of lateral roots and the trees from root grafts stood as stiffly as any others.

NEW VARIETIES OF FRUITS.

Mr. H. E. Van Deman, pomologist of the Department of Agriculture, delivered an informal address upon this topic, from which we make some extracts:

Many good varieties of Plums had come, he said, from *Prunus Americana*, which extends all through our north and northwest regions. Among the newer varieties, the Hawkeye, from Iowa, is the best. It is the largest and most beautiful, although it is late, ripening six weeks after the ordinary Plum season. Cheney, from Minnesota, is another plum of medium size, very early, of a deep crimson color, but not so good as the Hawkeye when it is cooked. Ludlow is flat in shape, large, productive and of very pleasant flavor. Rollingstone is small, of a purplish red color, handsome and well-flavored. Leduc is a very pretty, small, yellow plum, originating in Minnesota. It is very productive and sweet, and will be valuable for a dessert fruit. Hopp is of medium size, dark, solid and very sweet. Clyman is a variety of *Prunus domestica*, and is as early as the Wild Goose, six weeks earlier than the ordinary Plums of this class. It sets full of fruit, and will probably be hardy in the middle states.

Among the Japanese plums, Botan is said to be hardy enough to ripen as far north as Connecticut. In shape it resembles the Kelsey. Ogon is yellow, nearly round, and as large as the Wild Goose. Kelsey is very large, three inches in diameter, purplish, heart-shaped; but it will not fruit north of Tennessee. Burbank is of medium size, crimson-purple in color, exceedingly beautiful, rich in flavor, and it will perhaps prove hardy in the middle states. Satsuma is smaller than Kelsey, but as large as the common plums. It is round, with dark red flesh and a small stone. One disadvantage of all Japanese Plums is that they bloom so early their blossoms are liable to be caught by the frost, as in the case of the Apricot. They all hold their foliage well, and this fits them to the vicissitudes of our very trying climate.

Of the newer Pears, the Krull, originating in Missouri, seems to be the best of winter Pears. It surpasses the Lawrence in quality and color. The Idaho has not been overrated as to quality, but as yet we have no warrant for believing that it is superior in hardness to many others.

Among Apples, the Garfield, originating in northern Illinois, seems to be hardy in that trying region. It is not so large as Ben Davis. It has a brilliant crimson stripe on a yellow ground, rich and handsome in appearance and fair in quality. Lacon is of about the same quality, yellowish, and its hardness would seem to warrant trying it in the northwest. Shirk originated in Indiana. It is very sweet and of a high color. The tree is a fine grower, and it is an excellent fall sweet apple, and hangs well on the tree. Bullman has been widely advertised, but it seems to be a synonym for the Red Canada. The Pepper is a seedling of Pewaukee and is very promising. It is of medium size, red, white fleshed, a natural seedling, and is very hardy. The Foundling is an old variety of New England origin, which has been strangely overlooked until late years. It is quite hardy in the northern part of New England; very pretty, with red stripes on a yellow ground, and keeps late into the winter.

Of Strawberries the only new variety spoken of was Pearl, which is said to be one of the best, with berries of good size and held well above the ground on strong stems. It seems adapted to different kinds of soils.

Among nuts mention was made of many good varieties of our wild Chestnut, some of which are of excellent quality. One named Dupont, from Delaware, is very large. A rich tree often yielded nuts to the value of \$30 and \$50 a year.

The Paragon, which has been sent out by Engle & Son, of Marietta, Pennsylvania, is larger yet, four or five times as large as the ordinary Chestnut. It bears enormously and at an early age. It is not quite so well flavored as the finest of the small Chestnuts, but it is of purely native origin and well worthy of cultivation.

Of the newer Grapes, the Lyon, originating in Michigan, was reported of fine quality. The vine is very vigorous; the clusters are of the Catawba shape, although the berries are smaller. Colrain, which is probably a seedling of the Concord, is a variety larger in bunch and berry than Martha, and earlier. The vine is stronger and as healthy as the Concord.

Mr. Campbell, in reply to the inquiry as to whether its skin was too tender for shipment, stated that it was no more tender than that of the Worden. The Woodruff Red has proved itself a rampant grower and very productive. It is not of the finest quality and has a rather thick skin, but it is an excellent popular market variety. Green Mountain is a strong vine, very fruitful and is probably the earliest white Grape of good quality. It is rather small in berry, however.

The Crandall Currant is a variety of the Missouri Currant and the largest of the wild varieties. It originated in Kansas and has the merit of being proof against the attacks of the Currant-worm. Nor do the leaves fall as they do from many other varieties of Currant from some unknown fungus growth.

Notes.

Peaches from California are now coming into market here, and so are the sour "English" Cherries from the south.

Le Jardin, commenting upon the poisonous properties of *Primula obconica*, says that the common European Primrose will irritate and burn the lips if bitten.

It is announced in some Oregon papers that an excellent syrup, clear and well flavored, has been made from the sap of the Vine Maple (*Acer circinatum*).

Magnolia hypoleuca is just coming into bloom. Remarkably beautiful flowers of this species and of *M. parviflora* were shown at the Nurserymen's Convention last week by Mr. S. B. Parsons.

Professor Oliver, after a connection of thirty years with the herbarium of the Royal Gardens at Kew, of which for many years he has been the curator, retires from office. He is, however, to continue to reside at Kew, and will continue to edit Hooker's "Icones Plantarum," in which the most important and interesting of the new plants received at the Kew herbarium are figured and described.

The statement is made in an interesting article on the forests of Roumania, recently published in the *Revue des Eaux et Forêts*, that the American Locust-tree (*Robinia Pseudacacia*) has been used with great success in that country in holding the shifting sand at several places along the banks of the Danube, and that during the last five or six years twelve or fifteen thousand acres have been covered with plantations of this tree for this purpose.

There is wisdom as well as charity in the following words spoken by Mrs. Helen V. Austin at a recent meeting of the New Jersey Horticultural Society: "We are often told that if fruit-trees were planted in the street the boys would get the fruit. That would be one great object in thus planting, so that the boys and girls could get the fruit. The fact is that children are starving for fruit; and what with the scarcity of the article and the enclosures surrounding what there is, the average boy is forced into being a thief."

The *Revue Horticole*, quoting from the *Botanisch Jaarboek*, calls attention to the results of a curious series of experiments lately made in the Botanical Garden of Ghent for the purpose of determining whether the seeds which germinate the most rapidly produce the most vigorous plants, and whether, in the case of the Gilliflower, as had been affirmed by Dr. Nobbe, the plants which germinate first produce a larger proportion of double flowers than those in which the germination had been retarded. It appears that these experiments confirm the truth of the assertion. Such experiments, to be at all conclusive, must, of course, be repeated over and over again and on a very large scale; still, as Monsieur André suggests, they may be of immense horticultural significance.

The May issue of the *Bulletin of Miscellaneous Information* from the Royal Gardens at Kew contains correspondence on Lagos rubber, the product of the West African *Ficus Vogelii*; on a new Mealy Bug which has proved a troublesome and destructive pest among cultivated plants in Egypt, with a description and figure of the insect (*Crossotoma Egyptiacum*); on the machines used in the manufacture of hemp in the Mauritius, and on the Siberian perennial flax, about the use of which the authorities of Kew have endeavored to obtain some information in the hope that it might prove a substitute for the common Flax, which is an annual and therefore has to be raised from seed every year. The perennial Flax has numerous wiry, slender stems about one or two feet high. Many attempts have been made to utilize this plant for fibre and in the production of linseed oil, and it was supposed that it had been used for this purpose in Siberia. The correspondence, however, which Mr. Morris' inquiries have brought out, seems to show that it is doubtful if Flax on a commercial scale is anywhere produced except from the annual species.

The *American Agriculturist* for June gives an interesting account of the cultivation of Lima Beans in Ventura County, California, where the crop brings something like half a million dollars. The seed is planted in May by machines, which drill in three or four rows at a time. The plants are cultivated once or twice and never irrigated. No poles are used, but the vines cover hundreds of acres, clinging close to the ground like a green carpet. In August, when the beans are ripe, a V-shaped knife, with blades five or six feet long, and attached to a wooden sled, is drawn by three horses, which are guided between the rows by one man. Two rows are cut at once, and four men are kept busy raking the loosened vines into heaps to dry. Twenty acres are cut in a day. Three or four weeks are required to properly dry the beans, which are then run through a thresher, and the straw is stacked, to be used later as fodder for cattle and sheep. The average yield of Limas is 1,800 pounds to the acre, and these are worth \$44 at wholesale. A liberal estimate for expenses, including seed, planting, cultivating, cutting and harvesting, is \$8, leaving a profit of \$36 to the acre.

It is well known that the larvæ of the May-bug or Dor-bug do an immense amount of damage by eating the young roots of grasses, Strawberry and other delicate rooted plants. In France, especially, their ravages have resulted in great losses, and energetic attempts to destroy them are made. The destruction of these beetles is a matter of such importance that a word, "Hannetonnage," has been coined to express the action of hunting them. It appears, according to the *Revue Horticole*, that during the year 1889 the Department of Seine-et-Marne paid no less than 113,000 francs in prizes for the destruction of the beetles, which were collected to the amount of more than 500,000 pounds. They are trapped by suspending lights over shallow vessels of water. The beetles fly against the glass covering of the lamps and drop into the water below, and are then collected and destroyed. The experiment has been tried in this country with success, and it is worth doing on a large scale wherever these insects abound. As the presence of the larvæ is not known until the damage which they inflict is completed, the only way to attack them is to trap the beetles. A little kerosene-oil poured on the water placed in the vessels into which they are intended to fall will deprive them of all chance of escape.

It is well known that the practice of removing the flower-stems of Hyacinths and Tulips just as the spikes have attained full development prevails in all the bulb-farms of Holland. The general opinion is that there is but one object in view in depriving the plants of their beauty at its zenith—namely, to save the plants the strain of ripening seed, and to aid the development of the bulbs by the power thus conserved being devoted solely to them. It is recently stated, however, by a correspondent of the *Journal of Horticulture*, that one of the largest growers and exporters at Haarlem gives another explanation of the custom. The specific object of removing the flowers of Hyacinths and Tulips is, he says, to prevent the petals falling upon the leaves, which occasions spotting, commonly called "fire." When the foliage becomes thus affected its powers of assimilation and elaboration are materially curtailed, and the bulbs are greatly weakened. The strain of ripening seed is so small a consideration that in the case of Crocuses and Narcissi, which do not become "fired" by the falling flowers, it is not thought worth while to sacrifice the time necessary for removing the latter, and they are consequently allowed to fall. The manner of removing the flowers is merely a matter of convenience. Hyacinth spikes are cut off; Tulips, the stems of which are brittle, are broken with the fingers and thumb.

RECENT numbers of *The Forum* and of *The Country Gentleman* have contained articles from Mr. C. Wood Davis, a Kansas farmer, which attempt to show that the arable lands of the public domain have been so rapidly taken for agricultural use during the past twenty years that they will be completely occupied at a much earlier date than has heretofore been deemed possible. The fundamental reason generally given for abandoned farms in the east and

depressed agriculture in general has been the rapid expansion of the cultivated area of the country, and therefore the increase of staple farm products beyond the home demand for them. Whether certain prosperity awaits the farmer as soon as the country will consume all that he can produce is not a question to be discussed here, but the figures which indicate that we shall be compelled to import wheat before the end of the century are interesting.

It is probable that Mr. Davis underrates the productive capacity of our total farm area, but after making due allowance for this we are prepared to believe that his prophecy is worth considering. Our people have acquired a habit of boasting of the country's ability to feed the world and of our exhaustless wealth in general. But natural resources are not infinite. A few years ago we were talking of our exhaustless wealth of timber, but our forests of White Pine, the most important timber-tree of the continent, are no longer spoken of as boundless; dealers in hard-wood know that the supply of Walnut and Ash will not endure forever, and there is a growing belief that the Long-leaved Pine is doomed. In like manner we may soon discover that good land can no longer be had for the asking, and that every acre which can profitably be tilled, even with the help of irrigation, has been brought under the plow.

American Dried Fruits in Foreign Markets.

TWO complaints have been made against the healthfulness of American dried fruit. The first is that when this product is sulphur-bleached there is a question whether the after-drying removes all traces of the sulphur, and therefore whether the fruit has absorbed and retains enough sulphuric acid to impair its healthfulness and flavor. The other objection is that when fruit is dried on galvanized wire trays it takes up a sufficient quantity of zinc to make it poisonous. Very careful chemical tests made in this country have failed to secure any proof of the presence of free sulphuric acid, and Dr. Lattimore, in behalf of the New York State Board of Health, after testing numerous samples of the evaporated fruit, found no trace of zinc. Nevertheless the exclusion of our fruit from certain European markets particularly on account of alleged danger from zinc is a serious matter to producers. The fact seems to be that traces of zinc have been discovered in exported fruits, and although the quantity was so minute as to be utterly harmless, this serves as a pretext for shutting out our fruits from foreign markets, and therefore any remedy or any method of evaporation which will leave the dried fruit absolutely free from foreign substances is much to be desired. We add a portion of an interesting paper which was read by Mr. Michael Doyle, of Rochester, at the meeting of the Western New York Horticultural Society last winter, and which has been published in the proceedings of that meeting:

The agitation against evaporated fruits commenced in 1884 in Holland, and since then has spread to Germany, the largest consuming country in Europe, and later to the other adjacent countries. It is claimed by the health authorities that evaporated apples contain minute portions of the oxides of zinc to an extent more or less deleterious to human health. Not a single case of illness resulting from a proper use of this fruit has ever been reported in this country or the United Kingdom, notwithstanding the fact that tens of thousands of tons have been manufactured and consumed since the business began some eighteen years ago. The effort on the part of the German government to prevent the importation of this class of fruit has been based largely upon the desire of excluding it, for the object of encouraging the manufacture of the same class of goods in Germany. Only a few years ago the Hanoverian government gave the sum of 50,000 marks, say \$12,500, for the establishment of an evaporating factory, the first of its kind in that country. The promoter of the scheme did not, however, calculate with much accuracy upon the large quantity of fruit required to keep the factory in steady operation, and he found it impossible to secure a sufficient supply. Besides, the cost was so much above the value of the product when offered in competition with fruit shipped from this country, that the manufacture was only continued by drawing on the subsidy

of the government to cover the loss. In other words, fruit was offered from here at about seven and a half cents delivered at Bremen, while that made at Hildesheim cost fully ten cents per pound. As a result, the evaporator was operated until the donation of the government was exhausted, then stopped, and it has not since been reopened; for the German experimenters have found to their satisfaction that, in the present condition of orchard-culture in their country, they cannot compete profitably with America. This we believe to be the beginning of the alarm in that country over American apples.

It is safe to say that there is no more danger in fruit dried upon galvanized trays than there is from the employment of the ordinary tinned cooking utensils. At present it is almost impossible to do business with Germany without furnishing a sworn declaration as well as a chemist's certificate, attested by the Consul at New York, declaring and showing that the goods are absolutely free from zinc or zinc oxides. Goods which are found to contain even the most minute quantity are confiscated by the Government officials and their value destroyed by pouring crude petroleum on the fruit, which renders it unfit for food. As a result the business is done with no little hardship, and many houses in Hamburg and Bremen have abandoned the sale of American fruit, as the penalties, not only in the way of confiscation of the fruit, but of heavy fines and long imprisonment, are sufficient to make the dealers extremely careful and cautious in handling the product.

But although our fruit contains no injurious amount of zinc, we must prepare it absolutely free from every trace of the metal or we can make no sales. Fruit dried on wooden trays, or those made from netting, is absolutely free from zinc. Recent analysis has shown this; and although the change was made at a rather inopportune time, and rather late in the season, the quantity of fruit produced and dried on those trays was quite considerable, all of which has been taken without objection abroad. A prompt improvement is necessary, either by greater care in the use of galvanized trays, for it has been shown that the small particles of zinc found in the fruit have been caused by the use of the iron scrapers used in removing the fruit, which very often adheres to the wire, or by ceasing to use them. The use of these sieves for three seasons has shown a loss of twenty-four per cent. of the weight of the zinc galvanism by this means alone. In order to retain the trade established many years ago on the Continent it is imperative that some other system be employed, for it is only by abandoning the galvanized trays that the prejudice necessarily created against the product can be successfully overcome.

There is room for inventive genius in this direction, and proper remuneration will attend the successful efforts of the man who will offer to the manufacturers a satisfactory substitute for the galvanized wire now employed. It should possess fire-proof qualifications if of either wood or netting, and if metallic it should not be liable to oxidation and should not discolor the fruit. Just now this is the only impediment to increased trade abroad, which will undoubtedly follow these much needed improvements in the manufacture, and all fruit growers should be interested in pushing the industry to its maximum development, and thereby assure a remunerative outlet for our constantly increasing orchard-products.

Parterres in the Park of St. Germain.

NO more delightful place than St. Germain en Laye can be reached in a day's excursion from Paris. For generations the ancient palace and the adjacent forest were favorite resorts of royalty on pleasure bent, and the strong walls of the former frequently served as a safe place of retreat for one court faction or another especially during the wars of the Fronde. A so-called "New Palace" was built by Henri IV., but nothing now remains of it except some portions of its terrace walls and the pavilion called by his name. Adjoining this last is the magnificent terrace for the sake of which and the view that it affords the tourist now seeks St. Germain. It was constructed by Le Nôtre during the reign of Louis XIV., measures 12,500 yards in length by about forty yards in breadth, is planted with avenues of great trees, and commands a wide and beautiful panorama, with the winding Seine as the central feature and Paris far off in the distance.

In addition to this terrace Le Nôtre laid out extensive gardens at St. Germain and ornamented them with fountains and statues. But they have entirely disappeared. The garden shown in our picture is a modern creation and occupies a different site, a portion of the forest having been cut to make room for it. The forest fills a promontory formed by one of the bends of the Seine, and the trees it contains are chiefly

Oaks, Elms, Chestnuts and Hornbeams. Lacking the picturesque wild charm of the Forest of Fontainebleau, it has a sober and massive beauty of its own, with its dense growth of trees divided at regular intervals by straight avenues and alleys. It contains several small buildings, among them one called *Les Loges*, which is a government school for young girls. From this building the view we present (see page 299) is taken, showing another adaptation of that system of planting called "French parterres," to which we have several times referred during the past few months. Seen in connection with the building itself, the effect of such formal planting is, of course, better appreciated; but the picture shows how well it has been joined to the forest beyond. If this had the varied natural aspect we find at Fontainebleau, its association with a formal garden would have been less justifiable; but here, where it is formal itself in character, an appropriate garden foreground for a dignified structure has been secured with no violation of the laws of harmony.

Pinus glabra.

LOCAL in its distribution, and sparsely scattered amongst the rich and varied tree growth of the heavy forests in the southern states east of the Mississippi River, the Spruce Pine has until recently been but little noticed. It was described by Walter more than 100 years ago, but for the next seventy years it escaped the attention of botanists, when it was rediscovered by Mr. H. W. Ravenel, most probably in the same district where it was found in the coast region of South Carolina by the first investigator of the flora of that state. Subsequently Dr. Mellichamp observed the tree in several other localities of the coast near the southern limits of the state. About ten years later it was found by Professor Hilgard in the south-western part of Mississippi on the banks of the Pearl River, then by M. A. Curtiss in Florida on the Chattahoochee River; and the same year I traced its distribution through the eastern-gulf states to its western limit.

This Pine, generally known to the people of the country as the Spruce Pine, extends from the coast region of South Carolina just below the line of thirty-three degrees north latitude to the valley of the Pearl River, in Mississippi, to the latitude of thirty degrees thirty seconds, and is in that state as well as in Alabama confined to a belt of from 115 to 125 miles wide. It is found in dense woods with a soil of deep light loam rich in vegetable mould, retentive of moisture, but not wet, and particularly in situations where a more or less sandy subsoil favors a moderate under-drainage. Under the conditions of a mild climate, with an abundant rainfall, and a soil with a fair store of the elements of plant food, the forest-vegetation exhibits in greatest variety and luxuriance.

Here this Pine is found associated with magnificent Magnolias (*M. acuminata* and *M. macrophylla*), the Short-leaved Pine (*Pinus echinata*), the Red Bay (*Persea Carolinensis*), and almost unfailingly the Beech, with its dense foliage of freshest green during the earlier part of the season, standing forth in pleasing contrast with the dark, glistening leaves of the Magnolia and the sombre shades of the Pines. The variety of smaller trees and flowering shrubs adds to the charm and interest of the surroundings of this Pine, amongst them the Holly (*Ilex opaca*), Palmettos, the Farkelberry (*Vaccinium arboreum*), large, bush Huckleberries (*V. virgatum*), the Angelica-tree (*Aralia spinosa*), Red-flowering Buckeyes (*Æsculus Pavia*), Styraxes and Cornels, *Styrax grandiflora* and *Cornus sericea* being most conspicuous. These lands of a rich soil, and supporting such varied vegetation, called hummock lands, are most frequent in the coast region, where the streams emerge from the Pine-uplands to the plain or flat-woods fronting the sea-shore. The Spruce Pine is entirely wanting in the Pine-uplands or Pine-barrens proper, where the Long-leaved Pine forms exclusively the forest-growth. This last reappears again in the region of a mixed growth of coniferous and broad-leaved trees, forming in many parts the upper section of the coast Pine-belt, and extends not further to the northward than the Magnolia, the two trees following almost the same line in the northern limit of their distribution.

In Alabama and Mississippi the Spruce Pine is found singly or in groups of only a few individuals scattered in the localities favorable to its growth. In western Florida, between the Chocta-ha-chee and Chatta-ho-chee Rivers, it forms compact bodies of timber, extending over several acres, and in this region of its best development and greatest frequency its seedlings are found to occupy a prominent place amongst the second growth.

The Spruce Pine attains, on the average, a height between eighty and ninety feet, the tall, finely shaped, but gradually

tapering trunk, from sixteen to twenty-four inches in diameter rising clear of limb for a height of fifty to sixty feet above the ground. In a rich hummock on the Tensas River, in Alabama, rising above the Cypress swamp, a magnificent specimen was observed, rivaling in height the mighty denizens of the lagoon below, considerably over 100 feet in height and fully ten feet in circumference breast high. The bark of the trees of larger size is thick, furrowed lengthwise, somewhat flaky, of reddish brown color, getting closer toward the top, and is perfectly smooth in the crown and limbs, like the bark of the younger trees. The limbs, rising slightly, divide into numerous horizontally spreading branches and branchlets, multiplied by numerous sprouts from adventitious buds, thus imparting to the oval-shaped crown a greater compactness than is found in any other of the Atlantic Pines. The tender shoots of the season are flaccid, as in the Scrub Pine (*P. inops*), and by this peculiarity during the earlier part of the season the tree is readily distinguished from the Short-leaved Pine (*P. echinata*), its frequent associate, which it resembles in foliage, inflorescence and fruit. The leaves of the Spruce Pine are from one and a half to three inches long, and three of them are always found in the short, close sheath; they are more slender than those of the Short-leaved Pine, scarcely half as thick as they are wide, dark green, contorted, and, later in the season, spreading, and are shed during the third year. Densely covering the numerous divisions of the branches, the foliage of this tree is closer than in any of its allied species.

The flowers appear during the later part of March. The lateral short-peduncled cones mature during the second season. They are ovate-oblong in shape, about two inches long and one inch in greatest diameter, and their flexible scales have a flat apophysis and small deciduous prickle, which, in the mature cones, is altogether wanting. This Pine is less urgent in its demands for light and air than most of its congeners. It eschews exposed situations, and it is only under the most favorable conditions, insuring the greatest rapidity of growth during the first stage of its existence, that it is found to prevail in the openings of the forest. It is through all stages of its development of quick and steady growth. Trees felled in Baldwin County, Alabama, showing forty-five and fifty rings of annual growth, measured eighty and eighty-five feet in height and seventeen to nineteen inches in diameter. The rate of increase is greatest during the first ten years, after which it appears to differ but slightly during periods of the same length of time. In one of the trees the space occupied by the first ten rings was found to be two and three-eighths inches wide, by the second ten rings one and seven-eighths, the third one and three-fourths wide, and the fourth one and a half inches wide. The annual rings showed but slight differences in their width. The heart-wood can hardly be distinguished from the sap-wood. Mr. Fillibert Roth, of the University of Michigan, who has given much attention to the investigation of the structure of the wood of our southern Pines, finds the proportion of spring wood to that formed of summer cells in one ring, on the average, as three to two, and in almost every detail the anatomy of the wood of this tree is remarkably similar to that of the Loblolly Pine (*P. Tada*). The wood is light, only slightly resinous, straight-grained, splitting smoothly and satiny when finished, resembling the wood of the Spruce. It is not durable, is wanting in strength and elasticity, and is apt to shrink under exposure to the sun. Hence this rare and ornamental Pine is to be considered of little economic importance as a timber-tree.

Mobile.

Carl Mohr.

Anthracnose or Blight of the Oak.

THE members of the genus *Gliosporium* are upon the increase in this country, so that at the present time there is an anthracnose of many of our plants, some of which are quite injurious to crops. Thus *G. fructigenum* is so destructive upon the fruit of the Apple that it has taken the common name of "bitter rot." *G. venetum* is the anthracnose of the Blackberry and Raspberry, often defoliating the plants infested. *G. ribis* in like manner preys upon the foliage of the Gooseberry and Currant, and *G. Potentillæ* is the anthracnose of the Strawberry-vines. Others still, as *G. lagenarium*, cause the anthracnose or "spot rot" of cucumbers and melons.

With these citations to indicate that the genus is a widespread and destructive one, attention is called to a species of *Gliosporium* that is becoming very conspicuous from its destructive work upon the leaves of the Oak. As early in the season as the last of May, the "burning" and coiling of the leaves upon some White Oak-trees near New Brunswick were so complete that one of two friends during a recent drive called my attention to the "scorched" trees and asked for the

reason, while the other quickly volunteered the supposed explanation that it must have been caused by a fire.

Upon a careful study of the subject it was found that the brown, curled and dead leaves had been attacked by a fungus of the genus *Gliosporium*. In the worse cases the whole leaf was brown, but in many others only a portion had been killed, and of the latter the injured areas were along the main veins in the centre. In other words, the fungus is most active near the centre veins, including the midrib of the leaf, and spore-bearing pustules are usually situated in quite uniform rows, one upon each side of the vein. This is different from any other species of *Gliosporium*, which prefer the soft parts of the leaf and bear the minute blisters or spore patches midway between the portions of the leaf's framework.

This blight upon the Oak proves to be *Gliosporium nervisequum*, and is therefore the same as the one that has proved very destructive to the Sycamore or Button Wood (*Platanus occidentalis*)—in fact, this blight was so violent upon the latter host that it has received consideration in the *Journal of Mycology*. In this it is stated by Miss Southworth that "in some cases trees have been killed outright by the disease and in many the growth of the early part of the year has been completely destroyed. . . . Sometimes the young unglorified stem was attacked at some distance from the end." Also that in early spring "the external leaves of the unfolded buds showed the disease as soon as they were half out and many buds died before they were fairly open." It would seem from this that the blight fungus remains through the winter in the substance of the bud, but possibly only as spores lodged in the folds of the bud, which quickly germinate as the bud begins to unfold in the spring. However this may be, the probabilities are that an Oak-tree once attacked will continue to suffer from year to year and therefore if certain trees show the blight conspicuously it would be wise to mark such for the axe.

This note is written for two purposes: first, to answer the question quite sure to be raised, namely: What is the matter with the "scorched" Oak-trees? and secondly, to point out that the enemy has proved a dangerous one to the Sycamore in many parts of the country, and therefore the affected Oaks, other things being equal, should be the first to fall before the axe, that the further spread of the destructive disease may be checked. It would be interesting to learn how widespread this trouble is the present season.

Rutgers College, N. J.

Byron D. Halsted.

New or Little Known Plants.

Symphoricarpos occidentalis.*

THE North American genus *Symphoricarpos* is well known in gardens, where two of the species are cultivated as often, perhaps, as any of our native shrubs. These are the Snowberry (*S. racemosus*), which is valued for the snow-white berries which cluster along the branches, making a striking appearance in autumn and early winter; and the Coral-berry, or Indian Currant, as it is sometimes called (*S. vulgaris*), which is planted for the small dark red fruit which covers the branches in autumn. The flowers of these two plants, as well as of the other species of the genus, are small and not particularly conspicuous. Four or five species, in addition to the two generally cultivated, are found principally in the western and south-western parts of the United States and in Mexico. Little is known of these plants in gardens, although *S. occidentalis*, of which a figure from a drawing made by Mr. Faxon from the cultivated plant is published on page 297, has been grown for several years in the Arnold Arboretum.

Symphoricarpos occidentalis, like *S. racemosus* and *S. vulgaris*, belongs to Gray's first section, distinguished by the short and urceolate or campanulate corolla, generally less than a quarter of an inch long. It is a slender, graceful shrub, growing to a height of two or three feet, with rather stout terete stems covered with light brown bark. The leaves are oval or oblong, usually pointed and minutely apiculate at the apex, with entire or slightly sinuate margins. They are sometimes two or two and a half inches long and two inches broad, or often smaller, prominently reticulate veined, rather thick and leathery at maturity, and dull green on the upper, and pale on the lower surface,

which is hairy along the mid-rib and primary veins. The axillary flower-clusters are sessile or nearly so, or are sometimes produced on stems an inch or more long, becoming spicate. The pedicels and calyx are minutely puberulous. The corolla is deeply five-cleft, pale rosy pink, densely villous hirsute with long hairs on the inner surface, and rather shorter than the stamens and style. The fruit is a quarter of an inch in diameter and pale greenish white at maturity.

Symphoricarpos occidentalis inhabits rocky, wooded banks from Michigan to the mountains of Colorado and Montana, extending far northward, where it was discovered by Richardson on the Franklin Relief Expedition.

It is the fruit alone which makes *Symphoricarpos* valuable as a garden plant, and as the fruit of this species is less beautiful than the larger and more clearly colored fruit of the Snowberry, it is not probable that it will ever supplant that species in popular estimation. Shrubs, however, which are hardy in this climate, and produce fruit which is showy in the late autumn, are not too abundant, and the Wolfberry, as this species is called in the Floras, makes an interesting addition to the list.

The plants in the Arboretum were raised from seed sent many years ago from Colorado by Mr. T. S. Brandegee. They are perfectly hardy, and receive no special care or cultivation, and produce seed every year. C. S. S.

Plant Note.

Hardy Trees and Shrubs.

THE issue of the *Gardeners' Chronicle* published on the 17th of May was largely devoted to hardy trees and shrubs with showy flowers, the subject of the discussion at the meeting of the Royal Horticultural Society held in London the previous week. It contained a figure of *Prunus Pseudo-Cerasus*, a Japanese tree, much cultivated in Japan, where innumerable double-flowered varieties have been produced. It is a small hardy tree, with clusters of large white flowers flushed with pink. It is sometimes known in gardens as *Prunus Sieboldii*. *Prunus Wateri*, a double pink-flowered variety, is one of the handsomest of the forms of this tree known in our gardens, and certainly one of the most beautiful early spring-flowering trees in cultivation. *Zenobia*, or, as we call it in this country, *Andromeda speciosa*, is also figured. It is the most beautiful plant of its class, and, although rarely seen in American gardens, one of the very best shrubs in cultivation. In spite of the fact that it is a native of the warm coast region from North Carolina southward, it is perfectly hardy as far north as New England. There are figures, too, of *Exochorda grandiflora*, and of *Magnolia stellata*, the dwarf Japanese shrub often found in our gardens under the incorrect name of *Magnolia Hallii*. This last is a very hardy and free-flowering plant, which only needs to be better known to earn the position in popular favor which its great merit deserves. *Berberis stenophylla* is also figured, and so are the European *Amelanchier* and *Olearia Gunniana*. The first is a very pretty hybrid between two South American species—*B. Darwini* and *B. empetrifolia*. It is a plant of neat habit, with small dark green leaves and brilliant golden colored flowers; not always perfectly hardy in the northern part of this country, although it will flower here if the branches are slightly protected during winter. *Olearia Gunniana* is one of the *Compositæ* from Tasmania, with pretty Aster-like white flowers, which are often seen in the early spring in London gardens, but here, like other Antipodean plants, it will not thrive when exposed to the vicissitudes of the climate of eastern America.

Cultural Department.

Raspberries.

RASPBERRY culture has attained such proportions that it is probably foremost among small fruits, both for home and for market use. The improvement in varieties was not defined and satisfactory until we secured the Cuthbert. But earlier sorts were in some respects superior to this standard. The Philadelphia was an enormous bearer and entirely hardy; but its color was a dull purplish red, and its quality, though excellent, not so good as that of several others. The Turner

*I.—Hooker, "Fl. N. Am.," i., 285. Torrey & Gray, "Fl. N. Am.," ii., 4. Gray, "Syn. Fl.," ed. 2, 13.

was sent out by Professor Turner, the enthusiastic Indiana scholar. It was, and is yet, the best early berry; but if not closely cultivated, to prevent suckering, it is worse than useless. It is curious to contrast the superb berries and large crops on a row sharply hoed into hills and a row allowed to have its own way; on the latter you will get next to no fruit at all. I still believe in planting a moderate number of stools of these two sorts. The very best berry I ever tasted as well as finest to the eye, was the Pride of the Hudson, sent out by the late E. P. Roe; but it will not stand well in dry spots and is quite freaky every way. I plant a few yet for home use, but must select a half shaded, moist spot. Mr. Roe quickly refused to sell more of them.

Of purples, the first really good one was New Rochelle; and I advise any one to plant it yet for canning. The berry is not so large as Schaffers, but it is fine in flavor and enormously productive. The bush grows much like the black sorts, and it

Crimson Beauty are to be classed among the failures. Rancocas is not much better.

Of blacks I have very warm commendations yet for Davison's Thornless. This is a very early berry and good in quality. Its size is only medium and its bearing qualities not extraordinary; but it is thornless. I have seedlings from this sort that are some improvement on the parent. I suggest a good deal of effort to get seedlings from this stock until we get really the best. To get rid of the thorns in any branch of the Rose family is a matter of great importance. They are not needed under culture. We have discarded them from our Apples and Pears; we must also have thornless Raspberries.

Souhegan and Tyler are nearly alike and truly admirable. Gregg for late was a noble berry, but too tender. At present I plant, besides Davison, Palmer for early, Hilborn and Ada for later. I have very high expectations of Palmer, but have not much personal experience with it.



Fig. 42.—*Symphoricarpos occidentalis*.—See page 296.

roots at the tip. Schaffers kills back somewhat, but I always get good crops of large fruit. Where it does well it is a magnificent acquisition. These two purples far surpass the reds for canning, giving a superior flavor and more body.

Of the yellow varieties nothing was better than Brinkles Orange until Caroline was sent out. I am not so highly pleased with Golden Queen as some have expressed themselves; but it is a fine berry. For a near market the first is the best. It has no keeping quality. The value of yellow berries is mainly to secure something handsome by way of contrast with the red ones. For market, it is well to have one crate of yellow to ten of the reds and one or two of the purples.

We may wisely, I think, hold Cuthbert to be the main-stock red berry, adding Turner for early; for yellows planting mostly Golden Queen; and for purples New Rochelle and Schaffers. I have several other sorts on trial that may prove of high value. Marlboro is not a berry of high quality, but it may be advisable to plant it for early. Hansell and

For a small home garden select Turner and Cuthbert, Golden Queen, Schaffer, Davison and Palmer, and Hilborn.

The matter of culture is most important. Plant in the rows as close as you can; but keep your rows more than wide enough to cultivate with a horse. Set stakes every twenty feet and run one wire about four feet high. Tie the canes in bunches of two to four to the wires, with coarse hop twine. Tie tightly. Cut the canes back to six or seven feet. With wires you can grow them to that height safely and profitably. It is not an expensive plan, and the result is enormous crops. The high culture also prevents the need of cultivating the soil except in early spring.

Mulching is always good for everything, from Strawberries to Apple-trees; but the Raspberry likes a cool soil and an even temperature. The secret of success is mulching and wiring. But high culture so shades the soil as to prevent drying in ordinary seasons. The best mulch is sawdust.

I have a plan for growing red Raspberries in stools between

my Currant-bushes.' Set rows of Currants and Raspberries alternate with Grapes and Strawberries. The Strawberries do not injure the Grapes and give a fair crop. The Raspberries do not injure the Currants if not grown too thickly. It is always easy with the hoe to keep red Raspberries within reasonable bounds.

The increased acreage of berries does not any more than keep up with the increase of demand; and it will not. About one-half of the experiments made are very temporary, as berry culture to be profitable must be clean. *E. P. Powell.*
Clinton, N. Y.

Notes on Trees and Shrubs.

THE Laburnums in the vicinity of Boston have been unusually laden with their bright yellow blossoms this season, even very small plants bearing flowers in profusion. The Laburnum is not quite hardy enough to give general satisfaction in this climate, and, to succeed at all, it requires a somewhat sheltered situation, and more particularly a dry, well drained soil—a poor soil on a dry bank being preferable to a rich and moist one where growth would be rank and continued late in the season. Another trouble with these plants in this latitude lies in the fact that the bark of the main stems is sometimes liable to become destroyed or blighted in winter if the plants are in a position where the direct heat of the sun strikes upon them. Similar injuries are not uncommonly produced in some tender varieties of Pear and other fruit-trees as well as some other of simply ornamental value. Consequently, it is noticeable that the Laburnums which do best are those on the north side of a group of other trees, or even partly under their shade, so that the stems are not subjected to sudden thawings from the direct rays of the sun in midwinter. Since the Laburnum is commonly used in Europe as a standard stock upon which to graft *Cytisus purpureus* and other allied hardy ornamental species, and these grafted plants are sometimes imported into our northern gardens, care should be given to provide some shade in winter for the tall, bare stems.

In striking contrast to the floriferous aspect of the Laburnums is the barrenness of the Yellow-Wood-trees (*Cladrastis lutea*) this season. In all sorts of situations, as under high cultivation or growing on lawns, these trees are entirely without flowers. This species usually blooms regularly every year, and its behavior this season is unaccountable, because the last year's growth was vigorous and healthy and was not injured in the slightest degree during the past winter. The Locusts, however, are as full of bloom as usual. The hardiness of the Yellow-Wood and its hitherto general freedom from insect attacks and other diseases, seem to make it worth testing as a stock upon which to graft other species and varieties of the Pea family. In this country, when the Locust is used as a stock, the stems are often rendered almost worthless in a short time by the attacks of boring larvæ of several species of insects.

The Chinese *Deutzia parviflora*, of which an illustration appeared in the first volume of GARDEN AND FOREST (p. 365), has flowered as profusely as usual this season, and seems to be quite as hardy as *D. scabra* or *D. Sieboldiana* when growing under the same conditions. The tips of the branches are sometimes destroyed in winter, but the injury is rarely so severe as to seriously affect the blossoming. The flowers appear somewhat earlier than those of the hardy, common *D. gracilis*, and they fade away before the last species has passed its period of greatest beauty. The flowers of *D. parviflora* are very different in appearance from those of any other *Deutzia* in cultivation, although they may not surpass some of them in beauty and interest. While they would properly be described as white, the flowers of this species, when compared with those of *D. gracilis*, have not the pure snowy whiteness of the latter, but are slightly tinged creamy white, in some cases as deeply as the blossoms of *Philadelphus coronarius*, the most common "Syringa" or Mock Orange of our gardens. The flowers are prettily arranged in large corymbs, and they are as interesting when closely examined as when seen at a distance on the plants. They are of very uniform size on any plant, but on different plants they vary from a little over a third to over half an inch across. They are flat, with rounded petals, in general appearance resembling small Hawthorn blossoms more than any other familiar object. The fragrance, also, is strongly suggestive of the Hawthorn, though not so intense. *D. parviflora* is a stiff, upright growing plant, which attains a height of six or eight feet about Boston; and the flower-bearing branchlets are also rigidly erect and not flexuous. This species appears to be very rare in cultivation, but is likely to be much advertised in the near

future. The variations noticeable in the size and color of the flowers of seedling plants indicate that the species is capable of much improvement by selection and cultivation. Seed is produced on the plants here, and any peculiar form which may arise can be easily propagated by cuttings of ripe wood taken in the autumn or winter, or by green cuttings from the plants in June and July.

Arnold Arboretum.

J. G. Jack.

Notes on American Plants.

Brodiaea multiflora, from the Pacific coast, bears a close, round umbel of sessile, bluish purple flowers half an inch wide. But they are so close together that they have a different appearance from most of the *Brodiaeas*. The long naked stems grow about twenty inches high from a bulbous root, and the leaf is long and grass-like. It is a strong-growing species, but should be protected in winter.

Iris longipetala, from Oregon, blooms about the same time as our common *I. versicolor*. Its leaf is long and narrow, and the stem, usually two-flowered, is almost naked, a foot or more high. The flower is a trifle smaller and paler than that of *I. versicolor*, but a casual observer might think it the same if he did not compare the leaves of the two. It needs at least two years to become thoroughly established, and then it makes a pretty plant. The flowers are useful for bouquets.

Lilium parvum and *L. Columbianum* are both from the Pacific coast, and come into flower about the same time with the first of the Lilies. The former is a California plant, while the latter comes from the vicinity of the Columbia River, in Oregon and Washington. Both have reddish yellow flowers, with dark red spots in the centre, but the divisions of the flower turn back in *L. Columbianum*, which gives the flowers a different appearance. *L. parvum* seems to thrive best in a light loamy soil, while *L. Columbianum* needs a heavier clay loam or a mixture of clay. The leaf of the latter seems to dry up and die even before it is in bloom when set in a light soil. Both species have small flowers, but they are a little more numerous in *L. Columbianum*, and the plant is a third taller than the other.

Vancouveria hexandra is now in flower, and is a charming little plant. Its delicate dark green foliage, which in color and appearance somewhat resembles that of *Thalictrum anemonoides*, would alone make it worth growing. But the small waxen-white flowers, on long stems in a loose raceme, are delicate and pretty, peculiar in shape and valuable for cutting. It needs time to become established, but it soon spreads from underground stems and forms dense beds. It does fairly well in the open sun, but our plants that are placed in a thin shade do the best.

Allium falcatum, from Oregon, grows only four inches high, but its umbel of dark rose-purple flowers is very large for its height. The flowers are about half an inch wide. The divisions of the flower are very narrow, which gives it an odd appearance. Its very short stems make it worthless for cutting, but it is an interesting garden plant, remaining a long time in flower. It is probably not hardy.

Mimulus Lewisii, another native of Oregon, a foot or more high, has numerous crimson flowers, an inch long and nearly as wide at the mouth of the flower, very showy and durable. Open sunlight and a light soil seem to suit it.

Southwick, Mass.

F. H. Horsford.

Hardy Flowers in June.

APRIL and May are the brightest months in the rock garden, when Moss Pinks (*Phlox subulata*) in variety, Aubrietias, Arabis and Hepaticas are at their best. June is the brightest for the borders. Columbines are among the earliest and most beautiful, I think, of all border plants; and the handsomest of these is the Siberian species, *Aquilegia glandulosa*. It is quoted at high prices by dealers, but it is very easy to raise. There is some question as to the probability of obtaining the species true; but there should be little danger of its becoming hybridized, as it is nearly past blooming when the other species come in, with the exception of *A. Canadensis*, which does not seem to affect it. My plants from seed saved by myself are perfectly true. One-year-old seedlings bloom better than the best imported plants. This may be accounted for partly by the fact that all Columbines are impatient of removal. In our case they suffer very little from it, being removed from the nursery directly into the border.

The hybrids between *A. cœrulea* and *A. chrysantha* are beautiful, having the graceful curving spurs so well developed in *Chrysantha*. The blue and yellow varying in lighter and deeper shades harmonize splendidly. The "Munstead

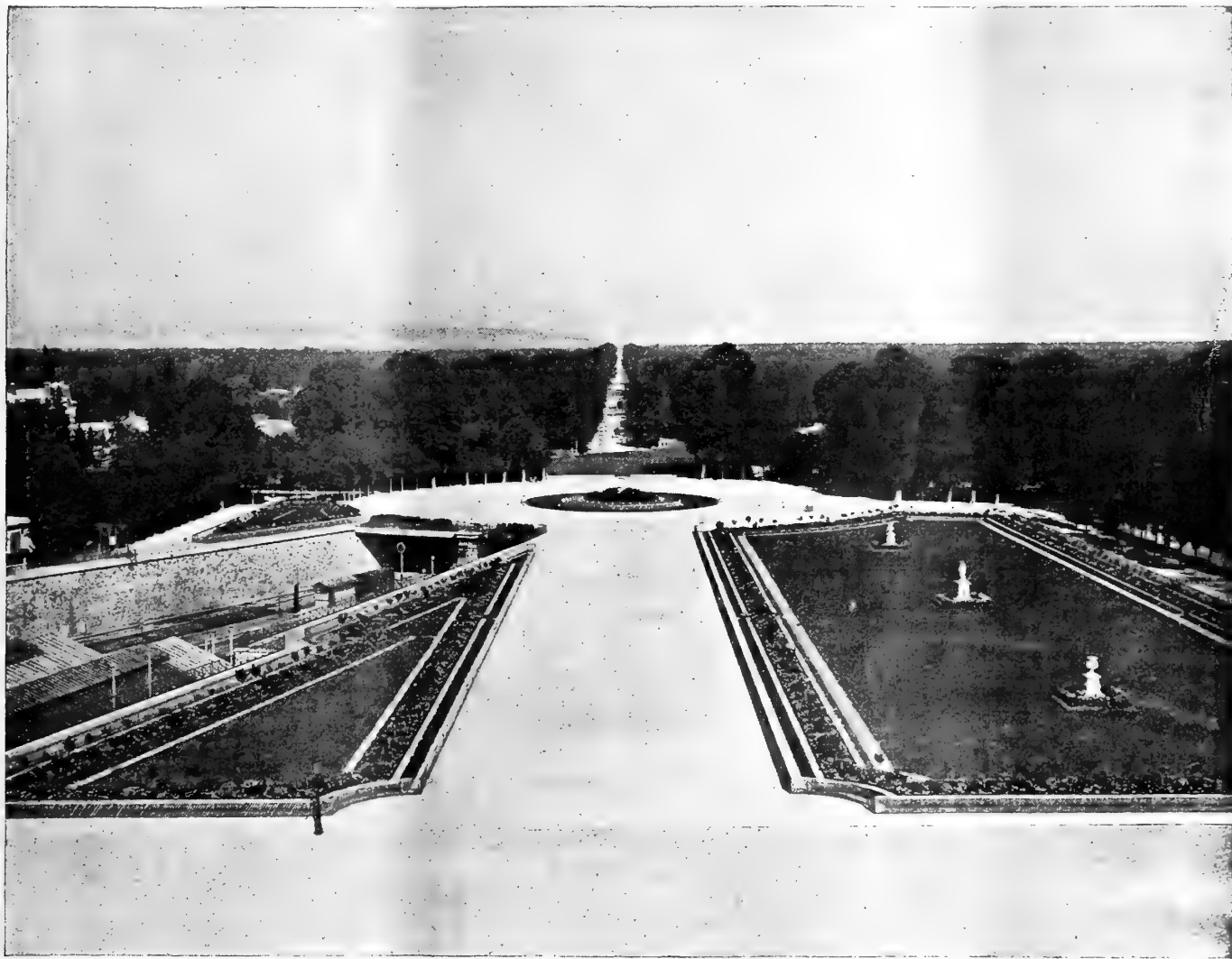
Giant," a white variety of *A. vulgaris*, is a very attractive border plant, and being of robust constitution is not so likely to die out as some of the more delicate kinds. Another bold kind is *A. Olympica*, with flowers of a lovely violet-blue.

Moutan Pæonies and German Iris, and later, herbaceous Pæonies follow. Any one wanting a gorgeous effect lasting through June can have nothing better than these with Sweet Williams mixed in. *Pæonia tenuifolia*, single and double, are striking and distinct, and very early. All the single varieties are handsome. They are easily obtained by sowing seed saved from the ordinary double varieties, about half of which come single or semi-double from seed. A friend tells me germination is assisted by soaking the seeds two weeks before sowing.

After these come Foxgloves. They are strikingly beautiful. We formerly protected them during the winter, but this season

Novelties in Hardy Plants.

THE new Carnation, Paul Engelheart, is without question the best border Carnation of the Clove section yet introduced. The color is the same as in the old Crimson Clove, but the flowers are almost twice the size, and, if possible, more fragrant than those of that good old garden plant. The great advantage claimed for Paul Engelheart is that the stems are stout and well able to support the large flowers, and this is so even when cultivated under glass. I am not positive that this Carnation is thoroughly hardy, but there is every reason to believe it will prove to be as hardy as all others of its class—that is, with a little dry litter placed round the plants in fall. With this treatment the Scotch Pinks generally winter nicely even in exposed situations, and furnish an abundance of beautiful, fragrant flowers in June.



Parterres in the Park of Saint Germain.—See page 294.

they have taken care of themselves in the shrubbery border, where they appear to be at home. The yellow-flowered species, *Digitalis ambigua*, is a distinct and attractive plant, and seems to be hardier than *D. purpurea*, the common kind.

The month finishes with Sweet Williams and Delphiniums at their best. Selection does considerable with these perennial Larkspurs. We have now some very fine double ones. I saved seeds from a lovely sky-blue flowered variety named Belladonna, which I am told never produces seed, and if so my plant must have been wrongly named, though trusting to memory I should say it was true enough. By hybridizing this with the old *D. formosum* I have some very fine distinct kinds and a few very double ones. No other plants furnish so wide a range of blue, from the palest to the most intense, as do these perennial Larkspurs. If they are cut back as the flowers fade, another crop of bloom will appear, so that they will brighten the border until autumn.

Wellesley, Mass.

T. D. H.

Of the two scarlet Delphiniums, *D. cardinale* and *D. nudicaule*, the latter is the best plant, being a better perennial than the former, but both are desirable owing to the quality of flowers they produce, the brilliance of their scarlet color, a color by no means common among hardy perennials, and the neat dwarf habit of the plants and their branching habit, which make them desirable for the front rows of flower-borders. Among recent novelties is an orange-colored variety of *D. nudicaule*, called *Aurantiacum*. This is fully as good a plant as the type, and differs from it only in the color of the flowers, which are of the brightest orange. These scarlet Larkspurs are often accused of being tender and only biennial in duration, but it is easy to raise them from seed, for the seeds germinate as readily as those of the old *D. Chinensis*, and it is surprising what an amount of satisfaction one derives from the fact of doing a plant well when it has a reputation for being hard to grow, especially when the subjects have a special beauty of their own as is the case with these scarlet Larkspurs.

I took occasion in a late number to advocate the cultivation of *Alstromerias*. Since those notes were written it has been our good fortune to flower the gem of the family *Alstromeria pelegriana alba*, the Lily of the Incas. This plant is far too rare in gardens even in the old world, and the only reason there can be for its not becoming more common is that so few have an idea of its exquisite beauty. In stature this species does not exceed eighteen inches, and the flowers are pure white, with a few spots of green in the throat, giving it a chaste beauty only to be compared to that of an Orchid. There is reason to believe that the Lily of the Incas will prove tender in the colder states, and it certainly would be unwise to risk a unique plant the first season, as it might be easily and safely wintered in a cool cellar and replanted in spring. The raising of *Alstromerias* from seed is easy, provided fresh seed can be obtained. Old seed often takes two years to germinate, and the seeds should be sown and kept under glass, since the plants are peculiar to South America. Our plants were received in the fall and were potted and kept dry until signs of growth were visible, when water was sparingly applied until spring, when flower buds were produced, and in May there were many umbels of the beautiful white flowers expanded, the plants promising to flower all summer, this being the way all the other species have behaved that we have tried.

Reading, Mass.

E. O. Orpet.

Odontoglossum maculatum.—During March, April and May one may begin to look among the *Odontoglossums* for the flower-spikes of this attractive species, although I have seen plants in flower in December and January also. The pseudobulbs are ovoid, much compressed, each furnished on the summit with a broad, grassy green leaf six to nine inches long, and distinctly veined longitudinally. The flowers, which vary in size, are usually two to three inches across, and are borne on pedicels about four inches long, clasped at the base by a large pale brown bract. The sepals are lanceolate-acute, sharply keeled behind, with a corresponding depression in front, the color of which is a very dark brown, with a few obscure pale green transverse markings at the base. In comparison, the petals are broader and shorter, oblong-ovate acute, suddenly narrowed at the base, and of a clear yellow color, heavily blotched on the lower half with dark brown. The lip is cordate-acute, with a jagged margin; it is yellow, like the petals, and covered with deep brown blotches, which stand out in bold relief against the ground color. The callus, or crest, is of a deeper yellow, with brown lines at the sides, and is something like that of *O. Rossii*, but has a central ridge dividing into two horns in front.

O. maculatum was discovered many years ago by La Llave & Lexarza in Mexico in the neighborhood of the Irapean Mountains, near Valladolid, but its first appearance in cultivation was due to Mr. Barker, of Birmingham, in whose collection it flowered for the first time about the year 1845. It has been largely imported since that time, and is now one of the best known *Odontoglossums*. A closely allied species is *O. cordatum*, also a Mexican plant, with which, in years gone by, *O. maculatum* was confused. *O. cordatum* may, however, be readily distinguished by its longer, narrower and more acuminate sepals, petals and lip, shorter pedicels and looser habit.

Pot cultivation seems to be the most suitable for *O. maculatum*, and a temperature varying from sixty to sixty-five degrees Fahr. in winter to seventy to seventy-five in summer. During growth water may be freely given, as well as enough air to enable the growths to ripen properly. The pots, of course, must be well drained with clean crocks, and the soil should be the usual compost of fibrous peat and sphagnum, in about equal proportions.

Salvia Splendens, *Ingénieur Clavenad*, is in bloom from seed planted in January. This variety was first offered this season, and, as will be seen, is rather earlier and blooms in a smaller state than the type, and the cluster of flowers is, perhaps, larger. The color is a bright scarlet, and it will probably prove valuable for early flowers.

Delphinium Nudicaule, var. *Auriantiacum*, is a new variety, probably not yet much distributed. Its habit is like the type, dwarf and compact; probably it will prove equally unreliable as a garden-flower. The flowers are small, of a pleasing reddish orange shade, and numerous. A very distinct plant for a collection, but very inconspicuous in comparison with the numerous very beautiful hybrids now in cultivation, than which there are few more pleasing and satisfactory plants for a large border.

Dianthus plumarius *hyb.*—There seems to have been little attention paid to this cross between *D. plumarius* and *Carna-*

tion remontant, made by M. Alegataire, of Lyons, a few years since. As the plants in their second year, in a bad spot in the border, prove to have a very sound constitution, it seems well to call attention to the hybrid, as some skillful cultivator may find it well to take it in hand and improve the flowers, which at present are single or semi-double and rather dull colored, though fragrant. It is a free grower with long stems, with a great flush of bloom in June and scattering flowers during the summer.

Elizabeth, N. J.

G.

Abutilons.—In connection with Dr. Masters' interesting article on "Sports" may be mentioned the peculiar action of stock on cion in the case of *Abutilons*. On a well-variegated form of *A. Thompsoni* were budded four varieties with green leaves. A yellow-flowered one took the variegation completely, and cuttings have retained it for two years. A strong variety with large, bell-shaped, red and orange-veined flowers took the variegation at first, and afterward lost it. One variety with pink flowers and cordate leaves showed no markings on the leaves; and the other with spreading, orange-striped flowers showed less than the stock, but was still decidedly variegated. The variegated form of *A. megapotamicum* will turn green on a green stock, and will show variegation on stock of variegated kinds.

Wellesley, Mass.

H.

Correspondence.

Gardens for Hardy Plants.

To the Editor of GARDEN AND FOREST:

Sir.—The interesting editorial on the Spring Garden in your issue of May 7th suggests a few thoughts on the cultivation of hardy plants in small gardens, where they are too often entirely lacking or represented possibly by a stray Phlox, Iris, Peony, or other strong growing plant, whose growth is so apparent in the early spring that it passes safely through the annual tidying up. During May one will observe that the average small garden, so-called, is an expanse of bare earth nicely raked over and waiting for warmth and the plunging of such tender plants as have survived in-door culture. One notices these plants later in various stages of surprised discouragement at the sudden change to fresh air and their slow progress to health and vigor. Where new plants are purchased annually it is a little better, but even then a good part of the growing season is over before the garden is fairly filled with foliage and flowers. Without intending any depreciation of tender and bedding plants, be they ever so common or commonplace, it does seem that one who is fond of a garden or enjoys country life misses much if he pursues year after year the old routine with such plants for the very short season from the middle of May to early October, when by a judicious selection the garden may be made a pleasure from April 1st to late November; and even longer in some seasons like the present, where flowers have not been wanting in some gardens since early January. By all means retain the old favorites; but why not secure a selection of long-lived plants which will invest the garden with an increasing charm every year, and then with the addition of a few good annuals the garden can be made interesting always, and to furnish great quantities of flowers for a long season. To get a garden of this character into a satisfactory condition requires study and time, and unless one has an inherent fondness for the work and some patience, it is not advisable to begin without the aid of a skilled gardener. But assuming that no such assistance is practicable, how shall one entirely unfamiliar with hardy plants who finds himself in possession of a small garden proceed to collect and grow hardy plants satisfactorily? This is too large a question for a brief reply. Perhaps a few notes from the standpoint of an amateur who has found in a small garden a pleasant relaxation during the few leisure hours of a busy life may be helpful.

The proper time to start such a garden is now, or any time when the borders may be dug. Do not be over ambitious at first or make such elaborate plans that discouragement will follow a lack of immediate success, but have a space or spaces in different parts of the garden deeply dug and loosened and add a fair amount of manure after taking care that the drainage is perfect, for the hardy-plant border, as a whole, should never again be disturbed. The more or less unreliable laboring men (not to dignify them by the name of gardeners), whom cultivators of small places are forced to employ, have so long annually upset every available bit of ground and ruined all perennial roots that it seems to have become a tradition that such a course is the only proper one. A slight

consideration will show that such a practice destroys all hope of satisfactory effects. If the border is well drained and well filled with plants and their roots, any deep disturbance of the ground must work some injury to them. The only possible excuse for disturbance would be that the soil might become sour if not stirred, but it will not grow sour if drained and full of growing roots, as a slight inspection of any bit of wild land will prove. Then this upsetting in the spring disturbs the seeds which naturally fall in the borders, many of which will germinate and prove useful in furnishing new plants for the border or for friends. One is also apt to have some favorite hardy annuals in the border, and one of the pleasures of spring is the annual appearance of these old friends from self-sown seeds, which usually produce strong, healthy plants. Advantage may be taken of the shifting or division of plants to lighten up the soil, and at convenient times during summer manure may be spread on the border if necessary to keep ground in good heart. It is also a good plan when dibbling out seedlings after watering to give them a slight mulch of well rotted manure, which saves much attention, helps to keep them clean and gives them a good start. An excellent position for a hardy border, and one often available in a small garden, is on the north side of a picket fence. In summer this shades the plants slightly, if at all, and during winter and early spring, when sun is low, shades them enough to prevent constant thawing and freezing, which is so fatal to many plants.

One who devotes himself to hardy perennials is necessarily forehanded, as plants are not to be had fully grown and in flower, and planting must anticipate flowering for some months usually. Where taste differs so much it is hard to advise as to the selection of plants, but probably the satisfactory plan for most novices would be to concentrate their efforts and select the more showy and free-growing plants, not trying for a general assortment, but for a fair number of certain families, so that during the season successive displays could be secured—accentuating the season, as it were—in different parts of the garden. Such selections, to name only common plants of a showy character in about the order of their blooming, would be Primulas, Daffodils, Dutch bulbs (Tulips, etc.), Columbines, Irises, Peonies, Poppies, Pyrethrums, Larkspurs, Hollyhocks, Sunflowers, Perennial Asters and Chrysanthemums. This list is a very short one, yet, if one were so disposed, he could find interesting occupation in collecting plants of only one of the families named. A small garden would scarcely contain specimens of all the various Irises, for example, numbering up to the hundreds, which may be had; and so with Primulas and others. Collecting, however, is one of the refinements of gardening which may be deferred until experience is gained. For a beginner it might prove more expensive than satisfactory. At first, it is well to acquire some knowledge of the various families and buy only plants which are likely to suit one's special taste, bearing in mind always that nurserymen's prices are no indication of the beauty of their flowers, except that for a beginner the cheapest are usually the very best, having been in cultivation a long while and found worth growing in quantity. One is apt to find, on growing a new plant, that the insect specially fond of it will quickly appear to claim his tribute, so the fancier whose taste is turned toward one family of plants finds that some enterprising florist manages every season to furnish a few new things exactly in that line, and he is assessed for an unending tribute. However, as man is a collecting animal, this is a very pleasant feature of gardening, and with as much of the excitement and as few annoyances as any of the usual fads. Many unkind things are said of the nurserymen, very unjustly, in connection with their offering of new plants, but usually by buyers entirely ignorant of flowers. No doubt, there are dishonest dealers who coolly advertise plants as belonging to a genus with which they are not even remotely connected, but it is usually the buyer's fault if he is deceived. One soon learns to neglect plants which will not please one's special taste, and yet almost any plant will prove of interest if it belongs to a family of which a collection is being made.

The heart of any garden is the seed frame, for from seeds one may raise most plants desired in quantity and it is an un-failing pleasure to watch them in all stages. The frame should occupy a sheltered spot and be covered with glass in winter and "shading" or slats in summer, and attention should be given to watering when necessary. In such a frame seed can be sown at any time it can be secured. Many seeds of hardy plants will germinate at once, some not for months, some only after warmth and some after freezing; so do not be in a hurry to disturb the seed-bed if plants do not soon appear. As to culture, one of the first discoveries the novice makes in a garden is that plants usually grow well—if you let

them. In good soil none of the popular plants are likely to prove difficult subjects to grow and one soon learns to note quickly any lack of vigor or health by the appearance of the foliage, which some simple remedy will set right. It is probably agreed that gardening is an empirical art and with our present knowledge of plant structure it is almost impossible to say without experiment under what conditions most plants will not live and thrive to a certain extent. Like man, certain of them have an adaptability to changed surroundings, though there seems no general rule for this. The Flag Iris of our swamps is usually found with its feet in water, yet it is an excellent plant for a dry border; remove a Lily pad from its floating home and the first sun shrivels it. Perhaps the best cultural directions can be found in such works as Canon Hole's "Book about Roses," in G. H. Ellwanger's "The Garden's Story," John Burrough's sketches, Alphonse Karr's "A Tour Round My Garden," and other books which inspire a love of nature and present pleasing pictures which one would wish to develop in a garden.

One should try to have his grounds filled with plants, leaving them as far as possible to their natural habits, crowded artfully that they do not smother each other, avoiding stiff, formal arrangements and leaving the culture of specimen plants to professionals, for the ultimate pleasure of the work is the cutting and distribution of the flowers and plants. Consider no flower too rare for a friend, and always let a liberal supply of stems and foliage accompany the gift—it is better to spoil a plant than a bouquet, in which one's reputation for taste is at stake.

Every owner of a garden should bear in mind those words from Alphonse Karr, "I do my utmost to spread and render common and vulgar all the plants and trees that I prefer; it is as if I multiplied the pleasure and the charms of beholding them of all who, like me, really love flowers for their splendor, their grace, and their perfume."

Elizabeth, N. J.

J. N. G.

Orchids in Flower at Wellesley, Massachusetts.

To the Editor of GARDEN AND FOREST:

Sir.—In the large conservatory connected with H. H. Hunnewell's residence at Wellesley, a fine display of Orchids in full bloom has recently been arranged in a very effective way. Just now the Cattleyas form the prominent feature, and many of the plants are remarkable for vigor and abundance of bloom. Among them I lately saw at least twenty-five examples of the beautiful *C. gigas*, many carrying several spikes each, and the blossoms were noteworthy for their size and coloring. A plant of the true variety, *Sanderiana*, measured nine and a half inches across, the sepals and petals being broad, the lip intensely rich, and the two eye-like blotches on either side of the brightest golden yellow. *Cattleya Mossiae* was also well represented; in some varieties I observed the purple coloring in the lip of the large flowers almost absent, and replaced by a blotch of rich yellow. *C. Mendelii* here had produced some fine varieties with round, well-shaped flowers, the broad-fringed lips being invariably very dark. *C. Gaskelliana*, too, with its showy and fragrant blossoms, was flowering very abundantly. Among this group of plants were scattered several distinct varieties of *Lalia purpurata*, all large, well grown plants, and a fine example of the variety *Alba* carried several large, broad-petaled blossoms.

The rare *L. grandis*, with its buff-yellow sepals and petals and finely marked lip, was represented by a plant carrying three good-sized flowers. These were arranged together with a group of well-flowered *Odontoglossum vexillarium*. The plants were clean, strong and healthy, and were carrying six to eight flowers on a stem, and showing decided variations in color, from warm purple to a delicate white. A plant of the scarce variety *Cobbianum*, with flowers almost white, was very attractive. Some fine examples of the pretty *Oncidium Weltonii* had strong, well-branched spikes laden with quantities of bright olive-brown and purple flowers. The white and purple flowering *Odontoglossum cirrhosum* produced a charming effect, arranged with their long stems hanging gracefully among the flowers of the Cattleyas. Many *Dendrobiums*, too, were flowering freely. At least a dozen plants of *D. thyrsiflorum* were carrying three or four spikes each, and one specimen showed nine well developed clusters of its white and orange flowers. *D. Devonianum* hung from the roof, with a mass of flowers, on bulbs measuring three feet in length. A plant of Woolley's variety of *Sobralia macrantha* gave added interest to the group just named, its rich color blending harmoniously with that of the other flowers. Many examples of the beautiful *Odontoglossum crispum*, *O. Pescatorei* and *O.*

citrosimum added to the display, with fine specimens of *Cypripedium grande*, *C. caudatum*, *C. barbatum* and its variety, *C. Warrentii*, *C. Haynaldianum*, *C. Veitchii* and other excellent plants. A. Dimmock.

The American Association of Nurserymen.

Fifteenth Annual Meeting—II.

ABSTRACTS of a few more of the papers read at the Convention of Nurserymen in this city are given below. It is a matter of regret that our limits as to space will not permit us to quote them more fully.

THE RELATION OF NURSERYMEN TO THE FORESTRY PROBLEM.

The general ideas involved in the forestry problem are well known. There are two phases of it—the one which is concerned with bringing about a more rational management of our existing natural forests; the other, which contemplates the need of creating artificial forests.

With the first part of the problem—the application of forestry or forest-management to the virgin woodlands—the nurseryman has a connection only in so far as he, like every other citizen, should take an interest in a rational development of the resources of our country. Of this interest it needs only to be stated that the forest-property, which we hold in common, the so-called Government timber-lands, are annually decimated by fire and theft at the rate of from \$10,000,000 to \$20,000,000 worth, for lack of proper administration; that under present methods of lumbering not only are forest-supplies squandered in an unintelligent manner, but the natural reforestation which would, under rational methods, take place, is, on large areas, made precarious or impossible; that the White Pine of the north is fast disappearing without reforesting itself to any extent; that several specially valuable timbers, like the Walnut and the Ash, are growing scarcer every year; that, by the denudation of slopes, by removing the forest and burning off the forest-floor, in many sections the soil is washed away, the water-flow is made uncertain, giving rise to excessive local floods and low water. In short, the lack of a rational forest-policy is apparent on every hand, and, as citizens, nurserymen ought to take an interest in changing the state of affairs.

In one way the nurseryman can exert by his knowledge and through his connection with arboriculture a special influence. One of the means employed by the forestry reformers to pave the way for a better forest-policy is the establishment of Arbor Days in all the states; now thirty-six states have such Arbor Days; we are ripe for a National Arbor Day. The idea of Arbor Day is not so much to increase the tree-growth of the country as to create, especially among the younger generation, a spirit of conservatism in opposition to the destructive spirit of the wood-chopper, a love for trees and a knowledge of their value. The nurseryman, with his knowledge of tree-growth, can aid and advance this reform work considerably by his advice. He can do more. He can assist by being present at the Arbor Day celebrations and show the ignorant how to handle a tree. He can do still more, if he is generously inclined, like Mr. George C. Roeding, of Fresno County, California, who furnishes this year on Arbor Day to every school district in his county, free of charge, two Maples, one Texas Umbrella-tree, two Fig-trees, one Pear-tree, one Locust-tree, two Olive-trees, one Fan Palm and two Rose-bushes. This is well directed generosity, and it is only necessary to promulgate the idea to have it generally appreciated by other generous nurserymen.

A more intimate relation of the nurseryman exists to the second part of the forestry question, the creation of new forests. Here his business interest comes into play more directly, and he becomes a more important factor in the forestry problem. In the old countries forestry began with the management of the natural woods, and when it became necessary to recuperate these by artificial planting or to create new forests, the forester grew his own material and planted it himself according to his knowledge of forest-conditions. It is questionable whether of the four to five million dollars which Germany spends annually for artificial planting an appreciable amount goes to nurserymen for plant-material, most of which is grown by the foresters themselves. Lately, however, some few large nurseries make quite a trade in supplying forest-tree seedlings and seeds.

In the United States this is quite different. Forests under management do not exist; forestry as a profession and foresters do not exist as yet, and the nurseryman not only furnishes the plant-material, but gives advice or even does the planting himself under contract. Upon him rests largely the

responsibility whether this phase of the forestry problem shall be successfully solved, or whether its forest-planting become soon a well established practice, wherever needed, or whether its solution shall be kept back and failures be more frequent than successes.

There is no need of discussing the question, whether, so far, nurserymen have discharged this responsibility successfully; whether, considering the novelty of conditions, absence of experience and the many other difficulties attending this, to them, new departure in arboriculture, they have done the best they could; nor is this the occasion to inquire to what extent forest-planting is practiced or to criticise defective measures or even to propose new methods. Every one who is familiar with the subject knows that, greatly as the practice of planting to forest has increased of late, a much greater increase is necessary to make a visible impression upon the treeless plains of the west, and still more so to recuperate the waste lands in the east, and to fill the gap made by the lumbermen in the north. Such enterprising men as Robert Douglas, Thomas Meehan and your first Vice-President, Mr. C. J. Carpenter, deserve public gratitude for what they have already done, and, no doubt, others are prepared to do as much; and yet it may be worth while to outline a few points for every nurseryman to consider when he contemplates any efforts in the line of forestry.

In the first place, he should recognize that forest-planting has a different object in view from the planting for which nurserymen have been and are most of them now accustomed to supply trees.

In the latter case it is beautiful form, shady or brilliant foliage, and, above all, it is the single tree he has to deal with. In forest-planting the ultimate object is timber and continued protection against climatic ills. Here he deals with masses, not with individuals. With the change of object, a change of method necessarily follows. What is right and proper in the selection of material and its disposition by the landscape-gardner, is not proper for the forest-planter.

The nurseryman, then, who undertakes to advise on forestry matters, cannot do so purely from his knowledge of the behavior of trees in open grounds and along road-sides, but he must have studied their behavior in the forest; he must have studied, at least, the principles of forestry; he must know by what means forestry, as a science, utilizes the behavior of different trees in combination, so as to produce desirable forest-growths and forest-effects in the cheapest manner and in the shortest time, imitating nature and yet improving upon her from the economical point of view. One of the principles which is well developed and established by the experience of European foresters is little understood among our forest-planters. This is the superiority not only of dense planting, but of mixed planting and grouping over the method of planting one species by itself. Yet it is not so much variety and promiscuity that is desired as some seem to think; there are much more rational objects to be served by such mixing and grouping. There must be a reason for the choice of a combination and a system in the arrangement, which is conscious of its object. Favorable forest-conditions are to be established as the first aim of the forest-planter, and these, as we find them in the best natural forest, consist in dense growth, mixed growth, undergrowth. By so much as any of these conditions is deficient or lacking, by so much is the forest short of the ideal.

In the selection of the species to be grouped, besides the capabilities of the same to thrive in this locality and soil-conditions and to yield the most desirable wood material, three points must guide the planter: (1) Their relative capacity for preserving and increasing favorable soil-conditions; (2) Their relative dependence for development on light and shade; (3) Their relative rate of height-growth. Without tracing at length the meaning of these points in particular, it may be stated as a consequence of their consideration that there are five principal rules to be kept in view in making selections for grouping:

I. The main growth, i. e., the one that occupies the larger part of the ground, must be of a kind that improves soil-conditions, namely, a densely foliated, shade-enduring kind, which does not lose its shading capacity with age.

II. Shade-enduring (i. e., densely foliated) kinds may be grouped together, if the slower grower will endure the shade of the rapid grower, or can be protected against its supremacy by being planted in larger specimens or in advance of the former, or in larger numbers; or if its gradual killing out after it has served its function of soil cover is not objected to.

III. Light-needing, i. e., thinly foliated kinds, should never be grouped together where soil-humidity is to be preserved, unless no shady tree can be found to fit the locality.

IV. In grouping light-needing with shade-enduring kinds, the former must be the more rapid growers or must otherwise be given an advantage.

V. The mixing in of the light-foliaged trees is preferable, done in single individuals and not in groups, unless special soil-conditions necessitate the latter method.

The last, and perhaps the most vital relation of the nurseryman to the forestry problem after his generous tendencies and communal interest have been touched, is one that touches his money interest.

The nurseryman furnishes the plant-material to the would-be forest-planter. What grave consequences does this have upon the success of the plantation! If honest service is of utmost importance to the producer of an annual crop, how much more must it be with a crop which matures only after many years! All the arguments for pure seed, fresh seed and seed true to name apply, of course, to the furnisher of forest-tree seeds and of plants as well, and more. The man who sells seedlings pulled from the forest for nursery-stock stands on the same plane with the man who sells oleomargarine for butter, or with any other fraud.

Buyers of ornamental stock spend their surplus for their pleasure; whether they pay a little more or a little less is in the end of not much consequence to them; they can readily allow an extra profit, since they themselves thereby suffer but little. The man who buys stock for forest-planting does so because of necessity, if he be on the naked prairie, or for profit. He cannot afford to pay more than the reasonable profit for what he buys.

Forestry, especially, which yields returns only after many years of investment, cannot afford to carry high initial expenditures on which to pay interest. The profitableness of forestry, any how, is a matter over which enthusiasts are apt to rave, judging from the results of some isolated and favorably conditioned cases, but which, when taken at large, cannot be so readily proved. Like any other legitimate business of a general nature, which is not capable of monopoly, it requires close calculation to make it a financial success. In a contract of a Nebraska nurseryman, who makes a practice of planting timber claims, the amount paid out for plant-material is forty per cent. of total cost of planting. (In Germany the plant-material costs thirty-four to forty-six per cent. of total cost.) It becomes, then, of considerable consequence whether good plant-material can be had at reasonable prices.

It is not easy to determine at what advance over the cost of production an article may be sold to make profitable business; so much depends upon the size of the business. A druggist must take from 100 to 500 per cent., while a steel mill may make money with a four per cent. margin. Nor is it easy to determine how far abundant and cheap supply will stimulate demand. Limited demand entails high prices, and an over-supply may have to be thrown away, because not salable, and the loss must be charged upon the part that is sold.

Mr. Fernow went on to give the cost of production of the seedlings in the Government Forest Nurseries in Germany, tabulating the elements which enter into the cost, and comparing them, so far as possible, with the conditions in this country. These tables were most instructive, but we have not space to reproduce them here. The conclusion of the whole matter was that the main service that the nurseryman can do for forestry is to provide reliable plant-material as cheaply as it can be done consistently with his own prosperity.

SCIENCE AND PRACTICE.

Mr. Thomas Meehan said that it had been fifty years since he wrote his first article for a horticultural paper, and it seemed to him, although horticulture had made rapid advances in all of those years, that it had not progressed as far on the scientific side as it ought to have done. As a practical example of some scientific truths, upon which good practice is based, he instanced the fact that fibrous roots live only a year. They do their work and then die. Where there are a hundred small roots now about a young tree there will be in a few years only a few large ones radiating from it, like railroads on a map. These big roots alone have the strength to send out fibres, and the root is of no value to the tree until new white fibres are growing. Therefore, it may be that a mass of fibrous roots in a tree for transplanting is injurious. They are weak, they have no vital power to put out rootlets, and they may keep the soil from contact with the big roots, which, therefore, do not find the proper medium in which to throw out feeding roots.

Another fact which observation teaches is that roots die in exact proportion to the amount of tops that are cut off. If a tree is pollarded nine-tenths of the roots may die and then invite

a fungus which spreads to the living roots. It is said that the branches which sprout from these pollards grow strongly because the roots are stronger below them, but in fact they grow from the food stored up in the trunk, just as shoots three or four feet long often grow out of logs which lie by the wayside. Generally pollarded trees die after this operation has been frequently performed. Look, for example, at an Osage Orange hedge. If one of the trees at the end is allowed to grow it will make a trunk as big as a man's body in twenty years, while the hedge plants of the same age, their vital power being weakened by constant cutting, are no larger than a man's wrist. Of course all pruning is not to be condemned, although it does weaken the vital power of the plant. We prune for other purposes than to make long-lived trees.

AUTUMN DELIVERIES OF NURSERY STOCK.

Mr. G. E. Meissner, of Missouri, in speaking of the shipment of nursery stock in autumn, said that in recent years the practice of contracting to deliver this stock very early in the fall has become so prevalent that the young trees are often dug for fall planting before the wood has fully ripened. They are torn from the ground while the young rootlets are still at work, and the leaves are stripped from them while they are still busy digesting the sap, and, of course, they are in no condition to endure the winter. Yet nurserymen often advertise deliveries as early as the 20th of September, because they say people demand it. It is for this reason, perhaps, that fall planting is coming into disrepute. Of course, planting which may be seasonable in Ohio is not so in Tennessee, and there is a great difference in the quality of trees in this respect. For example, a Currant-bush or Cherry-tree can be dug and shipped when a Wild Goose Plum would be ruined.

After some discussion, the Convention passed a resolution in which they disapproved and protested against the lifting of trees before the leaves had ripened and the wood had attained a proper degree of maturity, and requested all members to dis-courtenance and discourage this practice.

Massachusetts Horticultural Society.

THE Rhododendrons made a brilliant display at the Horticultural Hall, Boston, on the 7th instant. The chief exhibitors were Messrs. Nathaniel T. Kidder, of Milton; Francis B. Hayes, of Lexington; John L. Gardner, of Brookline, and H. H. Hunnewell, of Wellesley. The following selection gives the largest and best-formed trusses, with a good range of variety: James McIntosh, Michael Waterer, Princess Mary of Cambridge, Lady Grey Edgerton, Henry W. Sargent, Sherwoodii, *Purpureum grandiflorum*, *Delicatissimum*, Sir William Sebright, Charles Dickens, Sappho, The Queen, Sir Joseph Whitworth and Helen Waterer. The show of hardy Azaleas was rather weak and the varieties insufficiently distinct. It seemed a pity, however, to send so much of the plants with these flowers when less would have served the purpose as well.

The large white inflorescences of the old-fashioned Snow-ball, and the smaller, though more numerous, ones of the Japanese species, were very attractive. A single flowering branch of Laburnum was sufficient to show the highly decorative character of this elegant tree, and sprays of large-flowering varieties (not named) of Clematis suggested the utility of these climbing plants. Conspicuous among the exhibits of herbaceous plants were Oriental Poppies, Irises, Columbines and Day Lilies. The miscellaneous exhibits included a plant in bloom of the interesting and beautiful *Utricularia nelumbifolia*; flowering branches of that magnificent greenhouse climber, *Bougainvillea glabra*, and flowers of *Tacsonia Van Volxemi*, which is a splendid climbing greenhouse plant, with large crimson flowers.

Notes.

Green Corn is coming into market from the Carolinas, Raspberries from Norfolk, Watermelons from Georgia and Peaches from Florida.

The great Palm which stood in the Gardens of the British Embassy at Rome blew down during a late gale. This was not only the tallest Palm in Rome, but it was memorable because pierced by a cannon-ball during the attack on the city in September, 1870. It was strapped with iron where it had been struck.

The Central Park has never looked so well as it does this year, and much of the improvement comes from the removal of the decaying conifers, chiefly Norway Spruces, which last season disfigured its beauty. No one misses the thousands

that have been cut, not even the misguided enthusiasts who tried to impede the work of the park authorities.

Among the Hybrid Perpetual Roses blooming out-of-doors not one has behaved better this season than Ulrich Brunner, with its full and perfect buds, exquisite color and rare fragrance. The Baroness Rothschild, too, is blooming unusually well, and so are those excellent sorts, Magna Charta and Paul Ricaut. If they would only bloom again, as do other hybrids which have no China blood in them! John Hopper, Mrs. Charles Wood and Rev. J. B. Canim are uncommonly good, and Moss Roses never bloomed better.

The folly of protesting against the popularization of botanical names in the belief that vernacular ones are all-sufficient was recently shown in an article in a horticultural paper which spoke of the poisonous qualities of some of our common plants. "Ivy" and "Dogwood" were named as plants which it is dangerous for many persons even to handle. Of course the reference was to the so-called Poison Ivy and Poison Dogwood, neither of which has any relationship to the plant whose name has been given it. Both belong to the Rhus family, and, indeed, as Rhus is synonymous with the vernacular Sumach, there is no reason, save popular perversity, why they should not always be called Poison Sumachs. Such a misleading use of terms as we cite, where even the qualifying "Poison" was omitted, may well decrease the pleasure of timid readers as seeming to warn them against two kinds of beautiful and wholly innocuous plants.

A convenient little pamphlet on the treatment of plant-diseases has lately been sent out by the section of vegetable pathology of the Department of Agriculture. At various times we have called attention to the remedies as they have been tried and approved; but here are grouped together, in a score of pages, the remedies for diseases of the Grape, the powdery mildew of the Apple and the leaf-blight of the Pear by B. S. Galloway; Professor Maynard's experience with mildew of Lettuce and the Rose; Professor Halsted's study of gall-fungus and scald of the Cranberry; Professor Goff's application for Apple-scab, and the hot water remedy for smut in Oats by Professor Kellerman. The pamphlet also contains notes on the effect of certain fungicides upon the vitality of seeds, upon the contagious character of Peach yellows, upon copper salts as fungicides, and upon different spraying apparatus. The bulletin is an extract from the *Journal of Mycology*, vol. vi., No. 1.

In "Fort Ancient," a volume recently published by Mr. Warren K. Moorehead, of the Smithsonian Institute, a full description is given of the prehistoric remains in Warren County, Ohio, which are popularly called by this name. They seem to have formed a vast fortress of earthen walls nearly four miles in circumference, and a plausible supposition makes them not more than nine centuries old, and the work of the Mandan Indians, a branch of the great Dakotan or Siouan race. One of Mr. Moorehead's chief aims in writing his book was to advocate the preservation of the vast relic by the formation of a sort of public park similar to that which contains the more famous "Serpent Mound" in the same state now under the guardianship of the Peabody Museum of Archaeology. The interesting illustrated description of this Serpent Mound Park, which was recently published in the *Century Magazine*, should certainly excite even those who have not read Mr. Moorehead's book to interest themselves in the plan he proposes.

Since Professor Halsted's article on the Oak blight, in another column of this issue, was put in type we have noticed that the Sycamores in Central Park are generally affected. Some leaves from a diseased tree on Jersey City Heights were sent to New Brunswick, and the blight is identified as the true *Gliosporium nervisequum*. We have observed that the blight has extended throughout northern New Jersey and should be obliged if correspondents would report from other places. Professor Halsted writes that there is little hope from the application of fungicides, because the trees are large and the foliage cannot be easily reached. The injury to the foliage is so serious that the trees cannot last many seasons if the disease persists. The advice to cut down the badly affected Oaks and Sycamores, in the hope of exterminating the disease, seems rather radical, although Professor Halsted suggests it. There is no certainty that this remedy would be effectual, and the fungus itself could inflict no greater harm, because it would mean the extermination of the Sycamore in this region. There is always the hope that diseases of this sort, after running through a cycle, will be checked in some unknown way, disappearing as mysteriously as they came.

In the June number of the *North American Review* Ouida writes entertainingly about gardens, taking for her text a passage in which Lord Lytton reminds us that whoever has a garden has one chamber roofed by heaven, in which the poet and philosopher can feel at home. The seclusion and homelikeness which distinguish every real private garden from a public park are dwelt upon as its essential charm. It follows naturally that a place dedicated to retirement and reflection should be simple and natural, and this gives the author an argument against artificiality of construction, elaborateness of decoration and over much sweeping and pruning, and it justifies a plea for old-fashioned flowers, about which hang memories of a happy childhood. And here is a passage which we cannot forbear to quote: "Of all emotions which give the nature capable of it the purest and longest-lived pleasure, the sense of the beauty of natural things is the one which costs least pain in its indulgence, and most refines and elevates the character. The garden, the meadow, the wood, the orchard, are the schools in which this appreciative faculty is cultured most easily and enjoyably. Dostoevsky may find food for it on the desolate steppe, and Burns in the dreary plowed furrow; but to do this, genius must exist in the man who feels: it is to the ordinary sensibilities, the medium mind, the character which is malleable, but in no way unusual, that this training of the eye and of the heart is necessary; and for this training there is no school so happy and so useful as a garden. All children, or nearly all, take instinctive delight in gardens: it is very easy to make this delight not merely an instinctive, but an intelligent one; very easy to make the arrival of the first Crocus, the observation of the wren's nest in the Ivy-hedge, of the perennial wonders of frost and of sunshine, of the death and the resurrection of Nature, of the deepest interest to a young mind athirst for marvels."

Monsieur Franchet publishes in the *Revue Horticole* of May 16th an important paper on the new species of *Lespedeza* recently discovered in western and south-western China. His remarks on the climate of this last region are of special interest, as this is now botanically one of the most interesting regions of the world from the great number of remarkable plants it contains, some of which, too, seem destined to play an important part in the decoration of gardens. "The temperature of the provinces of south-western China," Monsieur Franchet says, "and particularly that of Yu-nan, is not in effect as high as might be supposed if the question of latitude only is considered. In that region, which is absolutely continental, high altitudes reduce the temperature, which might otherwise be excessive on account of its neighborhood to the tropics. It is easy to understand that a region broken in all directions by mighty mountain chains, some of which, like the Tchangan, reach twelve to eighteen thousand feet, as is the case with several summits of the chain Li-kiang, and are covered by snow and eternal ice, although it is placed between the twenty-sixth and twenty-eighth degrees of north latitude, cannot have a uniformly high temperature; in fact, the vegetation of Yu-nan bears the mark of an exceedingly variable climate, although certain valleys, on account of their position and direction, attract heat and so become the refuge of a considerable number of tropical species, while the slopes of the mountains exposed to the north are occupied by a flora which resembles that of temperate regions, and where forests of *Rhododendrons* and of *Oak* are the prevalent features (*Quercus Bungeana* and *Q. dentata*, both species of which grow also in the neighborhood of Peking). It happens, therefore, that the greatest surprises greet the explorers of the vegetation of this region, who can in the same day pass from the plants of the tropics to those of the coldest regions of the world, gathering in the morning the *Casalpintia sepiaria*, for example, and end their day before little thickets of *Rhododendron fragrans*, the ordinary inhabitant of the polar region."

Catalogues Received.

J. G. BUBACH, Princeton, Ill.; Strawberries.—WILLIAM BULL, Chelsea, London, S. W., Eng.; Rare Plants and Orchids.—DAMMANN & Co., San Giovanni a Teduccio, near Naples, Italy; Bulbs, Roots and Orchids.—JOHN LAING & SONS, Forest Hill, London, S. E., Eng.; Plants, Novelties, Begonias, etc.—PITCHER & MANDA, Short Kings, N. J.; Cyripediums.—JAMES VEITCH & SONS, Coombe Wood, Kingston Hill, Surrey, Eng.; Plants, including Novelties for 1890.—THOMAS S. WARE, Tottenham, London, Eng.; Choice Dahlias and Summer Flowering Plants.—C. B. WHITNALL & Co., Milwaukee, Wis.; Palms and Ferns.—B. S. WILLIAMS & SON, Upper Holloway, London, N., Eng.; Orchids, Ferns, Palms, Stove and Greenhouse Plants.—YOKOHAMA GARDENERS' ASSOCIATION, No. 21 Nakamura, Yokohama, Japan; Plants, Shrubs, Trees, Seeds and Bulbs.

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The Locust Tree.

THERE is not in Europe a more interesting tree for Americans to visit than the venerable Locust in the garden of the Museum of Paris, whose portrait is reproduced on page 311. The first of its race to grow in the soil of Europe, it has survived for more than two centuries and a half the wars of the elements and the social cyclones which have swept over it. The seed from which it sprung was planted in 1635 by Vespasian Robin, gardener of Louis XII., in the Jardin du Roi, now called the Jardin des Plantes. Vespasian Robin was the son of a gardener more famous than himself, Jean Robin, who had charge of the Royal Gardens under Henry of Navarre; and it was for the elder Robin that Linnæus, more than a century after his death, named the genus Robinia, to which our Locust-tree belongs. Little is left of the old tree but the shell of the trunk and a few feeble branches which clothe themselves year after year with leaves and flowers, testifying to the wonderful vitality of the Locust-tree and to the care which has been bestowed upon this specimen by the authorities of the garden, the most interesting in the world, perhaps, in its historical associations with men famous in the annals of botany.

The Locust-tree (*Robinia Pseudacacia*) has excited, from a cultural point of view, more interest than any other inhabitant of the American forests. There is no other North American tree about which whole volumes have been written, and no other of our trees has been so enthusiastically praised or so widely scattered by cultivation.

The earliest account of the Locust-tree was published in 1640 by Parkinson in his classical "Theatrum Botanicum," it having been cultivated in England about that time by the Dutchman John Tradescant, a great traveler and botanist, who held the position of gardener to Charles I. Evelyn, in his "Sylva," published in 1664, records the fact that the Virginia Acacia thrives in the King's new plantation in St. James Park; while his great French contemporary, Duhamel, gave a few years earlier specific directions for its cultivation. A hundred years later the Locust had so grown in esteem in Europe that something was said

about it by nearly every writer who discussed rural economy or the possibility of increasing national wealth through the cultivation of exotic trees. The first book devoted entirely to the Locust was published in Paris in 1803. It is a small octavo of 314 pages, and is entitled "Lettre sur le Robinier connu sur le nom impropre de faux Acacia." It was written by M. N. François de Neufchateau, a Senator and member of the Institute. This work contains the essence of all that had been previously published about the tree in France, and a great deal of information relative to its culture and uses. A translation of portions of Monsieur François' essay is published in an English book on the Locust, which appeared from the pen of W. Withers, of Holt, in Norfolk, in 1842, under the title of "The Acacia-Tree: Its Growth, Qualities and Uses." William Cobbett, however, better known perhaps as the vituperative political essayist, Peter Pindar, than as an enthusiastic and successful planter of trees, did more by his writing and example than any other man to make known the value and spread the cultivation of the Locust-tree.

Cobbett, during a forced residence in the United States from 1817 to 1819, occupied himself in farming on Long Island, where he established a small nursery for the propagation of fruit and timber-trees. It was at this time that he came to the conclusion "that nothing in the timber line could be so great a benefit as the general cultivation of the Locust." On his return to England he carried a small package of the seeds of this tree home with him and began the systematic raising and selling of Locust-trees, his total sales amounting to more than a million plants. This he tells us in his book called "The Woodlands," which, in some respects, is the best book on tree-planting which has been written in the English language. The author in his preface gives his reasons for having written it: "Many years ago," he says, "I wished to know whether I could raise Birch-trees from the seed. I looked into two French books and into two English ones without being able to learn a word about the matter. I then looked into the great book of knowledge, the 'Encyclopædia Britannica'; there I found in the general dictionary, 'Birch-tree, see Betula, Botany Index.' I hastened to Betula with great eagerness; and there I found, 'Betula, see Birch-tree.' That was all; and this was pretty encouragement to one who wanted to get, from books, knowledge about the propagating and rearing of trees." There are tree-planters of the present generation who turn to the literature on the subject with results which are hardly more satisfactory. Cobbett's book has long been out of print, but no other work gives such clear and specific direction for rearing and planting trees, and there are portions of it which might well be reprinted for general circulation.

Cobbett's enthusiasm for the Locust-tree, and his zeal in propagating it, caused it to be planted generally in England in his time, and the fashion, as is often the case with English fashions, crossed the Atlantic, and fifty or sixty years ago no tree was so often planted in this country. Remnants of these old plantations may be seen up and down the Hudson River and in the neighborhood of all our seaboard cities; and the Locust is now fairly naturalized in a large part of the country east of the great plains, although originally its range was a comparatively restricted one, it being found only in the forests of the Alleghany Mountains, from Pennsylvania to northern Georgia, and, doubtfully, in a few isolated stations west of the Mississippi River. So far as the United States is concerned, however, the Locust-tree has not fulfilled the hopes of the early planters. It is preyed upon in this country by a horde of insects who bore into the trunk and destroy the trees or the value of their timber, and the prophecy of the younger Michaux, that the Locust-tree would become more common in Europe than in its native country, has probably been fulfilled.

It is, however, one of the few American trees, if not the only one, which has become really naturalized in Europe, and there is no other exotic tree which travelers in central

Europe see more frequently. This is due, in part, to the fact that it has been planted everywhere along the lines of railroads to hold the soil on the embankments, and because it is the favorite tree for the embellishment of the grounds surrounding the stations.

Long cultivation of this tree has given birth to many varieties, and of these the one known as the Parasol Acacia, with a dwarf, compact, spherical head, usually grafted as a tall standard, is one of the most popular ornamental trees in Europe, where it lines countless miles of roadside and adorns innumerable villa-gardens.

The great value of the Locust-tree is found in the wood which it produces. This is heavy, exceedingly hard and strong, very close-grained, and capable of withstanding for a long time the effects of decay when placed in contact with the ground. This makes it one of the best woods known for fence-posts; it has many uses in ship-building, and is preferred to the wood of all other trees for tree-nails, for which purpose it is largely used. It grows rapidly from seed, which is produced in the greatest profusion, and it will adapt itself to almost every kind of soil. The rapidity of its growth is great, and thanks to the lightness of the shade cast by its compound leaves, it does less injury than most other trees to crops growing beneath its branches. The Locust is a good hedge-plant, too, and the fragrant white flowers are very beautiful. These are the qualities which have made the Locust popular, and were it not that it is so liable to the attacks of insects, the planters of the present day would be able to endorse all that Cobbett claimed for it.

An illustration in a recent issue of *The Garden*, London, indicates what delightful effects can be produced by naturalizing hardy spring-flowering plants in the grass. It represents a forest-scene in the grounds of Dunrobin Castle, with the turf about the trunks of the old trees thickly studded and completely carpeted with Snowdrops, which have been growing there from time immemorial.

There is certainly no more delightful and satisfactory form of gardening than that which naturalizes hardy plants, especially the plants which flower in early spring when every flower is doubly valuable. A thousand bulbs of the Poet's Narcissus, of the Snowdrop, or of the Squill, or of the Crocus, will produce infinitely more pleasure if they are planted in some wild spot by the edge of a wood or of a wood path, than the same number of plants are capable of giving in a formal flower-bed or border. Wild gardening, if the term is a permissible one, is the easiest and most economical of all forms of the gentle art. Once the plants are established in the proper soil and in the right situation, they require no further thought or care. All they need is to be let alone and to be allowed to go on growing and increasing and producing their flowers year after year.

The earlier in the autumn bulbs which produce their flowers in the spring can be set in the ground, the sooner they will become established and the better the results which they will give. This is the time, therefore, to study the lists of the dealers in plants of this sort, to determine which are to be planted and to order the bulbs.

There are a few rules which can be safely followed in gardening of this character. The most important of all is to select only such pieces of ground for planting with spring-flowering bulbs as need not be mowed until they have thoroughly matured their leaves, as the early cutting off of the leaves will weaken and finally destroy the bulbs. The turf of a lawn cut early and regularly with a lawn-mower is not, therefore, a suitable place for bulb-growing. If the grass is not cut until after the middle of June the leaves of nearly all the spring flowering species, even such late blooming ones as the Poet's Narcissus and the Wild Hyacinth, will be ripe enough to cut without injury; so that such plants can be naturalized in ordinary hay-fields, if it is desirable to do so, with perfect safety. Some judgment, too, must be used in selecting the plants to be employed in this sort of gardening. Those unchanged by

cultivation are better suited for the purpose than plants which the gardener has long worked over. The double Daffodil looks out of place by the borders of a wood walk, while all the single Narcissus appear perfectly at home in such a situation. The wild Hyacinth and the other Squills, the Snowdrops and the Crocuses, never appear too fine for any bit of natural scenery, while a garden Tulip or a garden Hyacinth, gaudy and beautiful although they be in a formal parterre, spoil with their artificiality the simple beauty of a woodland glade or of a smiling meadow. In our climate, where the enjoyment of the earliest spring-flowering plants is often interfered with by melting snow and by the mud of late March and early April, few wild plants can be used with more safety and with a greater prospect of pleasure than the Poet's Narcissus and the wild Hyacinth (*Scilla campanulata*). The two flower at the same time and the blue bells of the latter make the most charming contrast with the pure white flowers of the former. They flower here simultaneously, too, with many of the native plants which are most desirable in the garden, such as the Trilliums, the Phloxes and the early Lady's Slippers.

So, to the owners of gardens we can only repeat what has been said so often before in these columns, that if they want to obtain the greatest amount of pleasure with the smallest outlay of labor and money, let them plant hardy bulbs, and the more the better; and the sooner their plans are laid and their plants ordered, the better will be their chances of success.

The Kecskemet Heath.

HEATH—*Heide*—is in Germany a generic term for any stretch of sandy, uncultivated country, whether it be covered only with grass and scrubby, low vegetation or more or less generally with poor trees. Such a heath formerly stretched for many miles around the town of Kecskemet, in Hungary—an apparently limitless expanse of grass and shifting sand, which gave rough pasturage for herds of long-horned cattle and plethoric swine, guarded by peasants who, summer and winter, wore their characteristic sheep-skin coats, with the wool outside, and by the huge wolfish Hungarian sheep-dogs. A writer in the *Illustrierte Gartenzeitung*, of Vienna, tells, however, of the transformation which this semi-desert has undergone in recent times. Even in approaching Kecskemet by the railroad, he says, one is struck by this transformation, the road running for miles between embankments beyond which, instead of the former waste of drifting sand, bare of trees or shrubs, now extend luxuriant gardens, giving evidence of the most careful cultivation, vineyards and orchards succeeding on each other, or, most often, mingling their allied products. Closer observations only increase the surprise of the visitor. A half hour's drive from the suburbs in any direction takes him into real forests of fruit-trees, which cover many thousand acres of land, and, in their little clusters of farm-houses and peasant inns, sustain a population of 20,000 persons of the true ancient Magyar stock.

This great steppe, whose soil was of the coarsest sand, was to a large extent the property of the town, the municipality owning sixteen square miles—more, says our author, than the area of some of those little principalities into which the German kingdom was formerly divided. In order to redeem this district, the town, some thirty or forty years ago, granted a portion of it to its inhabitants on condition that it should be cultivated, recommending especially the planting of orchards. Now Kecskemet fruit is famous not only in Austria but in Russia, and in a good year brings the dealers of the town a profit of half a million dollars. Broad highways run for miles in all directions from the town, planted with hedges and avenues. It is interesting to note that the only trees our author mentions in this connection are of American origin. The Locust, he says, is most generally employed, but the Gleditschia (Three-thorned *Acacia*) is also much used, having proved an excellent protection against the storms which sweep over the heath and the drifting of its sands. Apples form the chief crop, although apricots are grown in such quantities that whole trains filled with them are dispatched during the season to various parts of Germany and Russia. Pears are likewise grown, and cucumbers, melons and paprikas, of which a great specialty is made. But the grape vies with the apple in importance. The vines are grown in the way usually adopted in southern Germany as well as in southern France, being closely

set without stakes. They cover the ground in the orchards between the trees, and are also trained on espaliers or fences along the highways and to form the divisions between the fields. The sandy soil seems to have protected them against the ravages of the phylloxera, and the quantity of wine they yield is large and ever increasing, although its quality is not so good as that produced on the hills in other parts of Hungary. When the development of this industry was first thought of the government planted an experiment station of large extent with six hundred varieties of the Grape, American as well as European sorts being tried, and with this was combined an experimental orchard. To-day the municipality also owns a "Town-garden" containing about one thousand fruit trees of the finest sorts, and itself administers large tracts of the former heath. But it is not more interested in improving its own property than in spreading information among private cultivators and encouraging them to new efforts. With these ends in view it has established a large agricultural school and in fourteen of the scattered little communes on the heath has founded village schools for the education of the neighboring peasant children. During the winter they are taught in the usual way from books, but in the spring the teacher grasps spade and hoe, and in the extensive garden that adjoins the school, gives practical instruction in horticulture.

In short, within forty or fifty years, at a comparatively small outlay of money, a vast, forbidding desert has been transformed into a garden blossoming like the Rose, where no foot of ground is wasted, and where the once half-nomadic, half-savage population is steadily growing in intelligence as well as in wealth. And the town to whose municipality the credit for the work must be given, has itself profited by the increase of trade to a degree that is said to be fairly surprising. Intelligent direction and concerted effort, without any great expenditure of money, have accomplished these results.

Who is the Vandal?

MR. FERNOW is writing some tracts on Tree Topics in *Kate Fields' Washington*, and the first of the series is devoted to the education of those whose misguided affection for single trees leads them to shudder when any proper thinning out of park plantations is attempted. In the grounds of a public institution in Washington, planted by Downing, the trees are choked and disfigured for lack of proper care, and yet the officials will not allow a tree to be cut, being restrained, it is said, by sentiments of reverence. "You propose to cut a tree in this park?" cries the indignant enthusiast. "You are a vandal!"

"My friend," replies the critic, "it is you who are the vandal. It is you who lack a civilized conception of fitness and beauty. It is you who do not see that by allowing this tree to stand you are preventing the development of its more valuable neighbor. It is you who, from a purely sentimental motive which you call reverence, will suffer your pets to choke and stunt each other till the beauty of a whole group is marred, in which the doomed member has outgrown its usefulness."

"Mr. Downing adapted the groups of trees and the shrubbery to make a pleasing picture at the time. He knew that the individual parts could not always retain their relation to the whole, and he never intended that they should. May his æsthetic spirit and his conception of the fitness of things descend upon those of our public officers by whose hands the beauty of our national capital may be either preserved and improved, or marred and destroyed."

Danger to Orange Groves in California.

AN important discussion is now going on respecting Florida-grown Orange-trees, which have been sold by thousands in California. Several nurserymen who found that the margin of profit was large, began to bring Florida Orange-trees to California several years ago, and at last established nurseries in Florida. The purple, or oyster-shell scale (*Mytilaspis citricola*) has been discovered on Florida stock in southern California, and so have the "long scale" (*M. Gloverii*), and the "chaff scale" (*Parlatoria Pergandii*), all of which are illustrated and described in Hubbard's "Insects Affecting the Orange." The "chaff scale" is often found on Orange-trees imported from China and Japan, and the inspectors have ordered more than one affected lot of trees to be destroyed. The Florida "red scale" (*Aspidiotus Ficus*) has also appeared in southern California on Florida stock, and on trees brought from Brazil. Professor Couquillett is reported in the *Rural Californian* as saying that ten new pests have been found this

year on imported stock. The newspapers and horticultural societies are taking up the matter and urging prompt measures to destroy every infected tree.

An orchardist at Santa Ana writes about an allied species of red scale, the *Aspidiotus aurantii*, in the following vivid manner: "The red scale is as dangerous and infectious to fruit interests as small-pox is among human beings. If any one wants to know what a destructive thing it is, let him come down in this vicinity and visit Orange. It is a pitiful sight to see what ruin has been caused by the indifference of the people when the pest first came into this valley. When I first saw Orange, in the fall of 1884, I thought it the garden spot of America. I never shall forget the luxuriance of the acres of Orange-orchards, and the prosperous looking places. There were then shipments of many car loads of Oranges from Orange station every spring, and there were dozens of men who got from \$2,000 to \$4,000 a year for their Orange-crops. The red scale came there in the spring of 1885. People talked a little about it, and a few said the pest would be serious unless stamped out at once. Their fears were ridiculed, and every one went on in an easy, indifferent way, while the little red scale multiplied, spread and devoured, until at last the people saw acre after acre of Orange-trees dead and dying. In Orange to-day, where there were hundreds of fine orchards five years ago, the land is now covered with the decaying stumps of Orange and Lemon-trees."

This sort of thing stirred up the Pomona and Riverside people, and their Inspectors have been at work for two months, examining every tree in the district, whether set in nursery or orchard. They long ago quarantined against the infested districts of California, and now the quarantine will undoubtedly be extended to all Florida-grown trees.

Niles, Cal.

Charles H. Shinn.

Legislation Against Fungous Diseases in New Jersey.

LAST year a large portion of my time was occupied in an investigation of the diseases of the Cranberry, the results of which were published in Bulletin 64 of the Experiment Station. Aside from the "Scald" of the Cranberry (sometimes called the "Rot") the next worst enemy is the Gall Fungus. This last takes a second place only, because it is at the present time very limited in the area upon which it was seen. A single large bog only was found infested with it, but from a study of the habits of the fungus it is evident that it spreads with the water during spring, and if it should effect an entrance into a bog it would soon develop in all parts through which the contaminated water flows. Fortunately, the water from the infested bog in question does not flow into any other bog or it would most certainly carry the disease there with it. It is, however, likely that the germs may be taken from one bog to another by birds and other animals, and by winds drifting the diseased leaves over the crust of snow upon fields in winter. The danger of this last mode of spreading infection is increased by the fact that several kinds of plants closely related to the Cranberry and growing upon the borders of the bog are also infested, and some of them drop their leaves in autumn.

The Gall Fungus has proved almost ruinous to the infested bog, and, because of this, and that it is as yet so circumscribed, the following law has been passed to cover all such cases of fungous diseases:

Whereas, The officers of the State Agricultural Experiment Station have discovered certain new fungous growths that threaten serious injury to important agricultural interests of the state, therefore,

1. Be it enacted by the Senate and General Assembly of the State of New Jersey: That when the officers of the State Agricultural Experiment Station shall discover any new fungous growth which is doing injury to plants or vines, and while the same is confined to limited areas, they are hereby authorized and empowered to enter upon any lands bearing vines or plants so affected, and destroy the same by fire or otherwise as they shall deem best.

2. And be it enacted, That any damage to private property resulting from the operation of destroying the said fungous growth by the officers of the state shall be certified to by them and the amount of damage paid to the owners thereof from the same fund and in the same manner as is paid to owners of diseased animals by order of the State Board of Health.

3. And be it enacted, That expenditures under this act shall not exceed one thousand dollars in any one year.

4. And be it enacted, That this act take effect immediately.

Approved May 23d, 1890.

It will be seen that, according to this act, means can be taken

for the extermination of the Gall Fungus upon the infested Cranberry-bog. In this case it will mean not simply the burning or drowning of the diseased Cranberry-vines, but the destruction of those species of shrubs along the shore of the bog that are attacked by the galls. A mildew, quite fatal to Cucumbers under glass, was recently found within the state, and this may prove to be another case that can be successfully handled under the new law. In like manner, within the past fortnight, the station botanist has found a parasitic fungus unknown before in this country (*Peronospora Rubi*, Rabenh.) upon the cultivated Raspberry. This will need careful watching, and if found destructive, and, at the same time, limited to one garden, it can be eradicated. A larger field is already open for the exercise of the law; for example, the destruction of Plum and Cherry-trees already worthless from the ravages of the black knot, especially of those growing half wild in the roadways.

Rutgers College.

Byron D. Halsted.

Plant Note.

Hybrid Firs.

Monsieur E. Bailly, writing in the *Revue Horticole*, describes under the name of *Abies insignis* and *Abies Nordmanniana speciosa* two hybrid Firs which have appeared in European gardens. The first originated in the nurseries of Monsieur Rennault of Bulgnéville, in France. It was raised from seeds of a tree of *Abies pectinata* grafted with *Abies Pinsapo* in 1848-49. The remarkable appearance of some of the seedlings raised from this tree led their owner to suppose at first that the graft had been effected by the stock, and that they were really the result of a graft-hybrid. Afterward, however, it was remembered that a tree of *Abies Nordmanniana* growing at a distance of four or five hundred feet produced male flowers, so that it is not improbable that the belief that the hybrid is the result of a cross of the flowers of *A. Pinsapo*, impregnated by the pollen of *A. Nordmanniana*, is correct. Perhaps not the least interesting part of the matter is that the hybrid plants have proved hardier than plants of *A. Pinsapo* growing with them. Speaking of the plants, Monsieur Bailly says "the affinity of the hybrid with *Abies Nordmanniana* and *A. Pinsapo* does not appear to be doubtful. It unites the two species by its botanical characters and establishes between them a sort of union. The habit of the trees, the arrangement of the branches, the color and the arrangement of the leaves, recall those of *A. Nordmanniana*, but the thickness of the leaves and their coriaceous consistency are rather those of *A. Pinsapo*. The arrangement of the leaves is intermediate between those of the two parents. In form their apex is not acuminate or often mucronate, like that of the mother-plant; nor truncate, like that of the pollen parent, but is subacute or obtuse. From an ornamental point of view this hybrid is not without value. It is, on the contrary, a very handsome tree, elegant and vigorous, of good habit, and one to which I wish to invite the attention of lovers of conifers."

The second of these hybrids, *Abies Nordmanniana speciosa*, was produced by Monsieur Croux, the nurseryman, of Aulnay, near Sceaux, in the neighborhood of Paris, who fertilized female flowers of *A. Nordmanniana* with the pollen of *A. Pinsapo* in 1871 or 1872, care having been taken at the time to remove from the plant of *A. Nordmanniana* operated on all the male flowers before they reached maturity. Another hybrid *Abies* exists in the garden of Monsieur H. de Vilmorin—a cross between *A. Pinsapo* and *A. Cephalonica*. Monsieur Bailly asks, in view of the rapid and vigorous growth of these three hybrids, if there may not be an advantage from an economic point of view in using them or other hybrids in forest plantations on a large scale. It is not, of course, improbable that a hardier, more vigorous and more valuable race of timber-producing trees may be obtained by hybridization, although until such a race could be fixed by long cultivation it will be necessary to resort to grafting in order to secure plants of the mixed breed.

New or Little Known Plants.

Cypripedium Philippinense.

OUR photograph of this interesting species on page 309 was made from a plant in Mr. Hicks Arnold's collection in this city, where it flowered in March of the present year. This handsome species was introduced from the Philippine Islands by Mr. John Gould Veitch many years ago, and long remained rare in cultivation. It is now more common, having been found by Roeberlen, a collector of

Sander & Co., in a region which has not been made public. The plant is generally sold and known in gardens as *Cypripedium Roeberlenii*, although there is apparently little doubt of its identity with the species from the Philippine Islands, which was, of course, described much earlier. The flowers, which are about three inches across from tip to tip of the upper and lower sepals, are distinguished by a broadly ovate, pointed, whitish upper sepal striped with dark brown-purple, by a lower sepal, white with green veins, and by ribbon-like, pendulous petals furnished with short hairs and five or six inches long. They are twisted, yellow at the base, and dull, reddish purple along most of their length, with the exception of the apex, which is purple. The buff-yellow lip is faintly streaked with brown.

This species grows in one of the hottest regions of the world in the full blaze of a tropical sun and exposed to the force of tropical storms. It is therefore interesting to find that it adapts itself to cultivation, and that it will flourish when transferred to a city greenhouse, like the one in which Mr. Arnold grows his collection and which contains several fine specimens of rare plants, and which is instructive and interesting as showing what can be accomplished in a comparatively small greenhouse in which it is impossible to give to each plant the peculiar conditions of heat and light which are supposed essential to its welfare. The fact that a plant which theoretically ought to be as difficult to cultivate as *Cypripedium Philippinense* flourishes in conditions which seem equally favorable to a number of other plants which grow naturally under very dissimilar climatic conditions, and which are usually considered difficult to manage, shows very conclusively that the cultivation of Orchids is not such a delicate matter as many persons suppose, and that any one with a moderate sized greenhouse can grow successfully a large variety of the very best of them.

Mr. Arnold will, we trust, pardon us for thus calling attention to his greenhouse and its contents. Our excuse for doing so is our desire to point out that there are a great many people living in cities who are fond of flowers and have the means for gratifying their love for them who can with the aid of a small glass structure placed on one of the outbuildings of their dwellings gratify their tastes by cultivating many interesting plants. There certainly can be no more delightful adjunct to a city mansion than a small greenhouse or conservatory, and the pleasure it is capable of affording will increase in proportion as the owner himself understands his plants and studies their requirements.

Foreign Correspondence.

London Letter.

N YMPHÆAS are especially attractive now at Kew. A circular tank thirty-six feet in diameter is filled with the leaves and flowers of a large number of kinds. Best of all is *N. Zanzibarensis*, one of the Stellata section, but much superior to any other in the group. Its flowers are ten inches in diameter, and are in the form of huge cups colored deep purple-blue, the base shaded with crimson and the centre occupied with golden anthers. It is about five years since this plant made its debut at Kew, but its full dimensions have never been seen in England before this year, the enormous size of the flowers being the result of allowing the plant a bed of rich soil three feet across by two feet deep, instead of growing it in a large pot as hitherto. Almost as striking in size and color is the beautiful yellow-flowered *N. tuberosa flavescentis*, its blooms as large, as fragrant and charming in color as the most perfect of Maréchal Neil Roses. *N. Lotus*, var. *rubra*, with huge flowers colored rose-crimson, and *N. dentata* (white), *N. Ortgiesiana* (pink), *N. albo-pygmaea* (white), and the various forms of *N. stellata*, from pure white to blue, are all flowering freely, and in the morning at about eleven o'clock they form a magnificent picture. An aquarium well stocked with the best aquatic plants is about as charming as anything in the way of in-door gardening. At any rate, the Water Lily house at Kew is an exceptional attraction to visitors during the summer.

The Azalea garden at Kew is one of its most delightful features during the month of June, when the plants are in bloom.

A large open space, surrounded by magnificent trees, in groups or isolated, with long vistas terminating in views of the lake or of some handsome building, and carpeted with the softest of lawns, is filled with large specimen Azaleas, whose prototypes are wild in your country, but whose colors and fragrance are beyond description. This year the display has been grander than ever. The wisdom of clearing away some large trees which overshadowed the Azaleas, re-forming the beds and replanting the specimens in good soil is now showing itself in a wealth of bloom and intensity of color unequaled by anything else in the garden either in-doors or out. I am told that even in America these Azaleas do not meet with the appreciation which, as seen at Kew, they abundantly merit. Compared with them the garden Rhododendron is stiff and gaudy, whilst in fragrance they are only equaled by our native Honeysuckle. We are immensely proud of our garden of American Azaleas. Amongst them are specimen trees of Magnolias such as *M. Umbrella*, *M. auriculata*, *M. Soulangeana*, *M. conspicua* and *M. cordata*. Some of these are in flower now or are just over. Mr. Gumbleton, of Cork, informs me that *M. Campbelli*, the Himalayan species with enormous flowers colored rich crimson on the outside, would certainly be hardy at Kew. It is one of the grandest of the genus, but hitherto it has been grown under glass in England,



Fig 43.—Cypripedium Philippinense.—See page 308.

although in the south of Ireland there are magnificent specimens in the open air.

Musa Japonica is the name given to a plant which Messrs. Veitch & Sons introduced about ten years ago from Japan, and which has proved capable of out-door cultivation in their nursery at Coombe Wood. A plant of it at Kew, in the winter garden, is now in flower. It is of more than ordinary interest, as it appears to be the *M. Basjoo* of Japanese authors, of which hitherto very little was known. It has a stem ten feet high, leaves as long, a stout, drooping inflorescence, the most conspicuous character in which is the large size of the oval-concave bracts and their tawny brown color. A *Musa*, which has all the striking appearance of *M. sapientum* and which may be grown in a temperature as low as that of an ordinary situation in the south of England, is likely to prove of value horticulturally. The only *Musas* that are ever planted out-of-doors in England are *M. superba*, and its ally, *M. Ensete*, but these are too tender to bear a temperature approaching frost, and must, therefore, be taken in-doors during winter. A second *Musa*, likely to bear a lower temperature than many of the species, is grown at Kew as an unnamed species indigenous in Hong-Kong. Both these *Musas* form suckers freely, and, in positions suitable to them, they would soon form a large cluster of handsome foliage.

An exhibition of plants organized by the Royal Horticultural Society, and held last week in the Temple Gardens, adjoining the Strand, was remarkable in many ways. Hitherto the exceptional efforts of this Society to get together a big display of plants, and to induce a big crowd to go and see them, have been spoilt by bad weather or some other circumstance

beyond control. This time, however, the weather and everything else appeared to smile on the Society, the result being one of the most successful gatherings of plants and people ever seen in London. A peculiarity of the exhibition was the total absence of money prizes—the awards being only cups or medals. It was feared by many that this new departure would prove a mistake. Instead, however, of its effect being a thin show it was, on the contrary, an unusually full one. The nurserymen did wonders, both in respect to number and quality of their exhibits and in the skillful cultivation they displayed. The power and numbers of the nurserymen of England were very strongly revealed in this show. A few, who must be set down as short-sighted, disparaged the exhibition on this account, arguing that it was from purely commercial motives that the nurseryman exhibited. Probably that is true, but the motive of the private gardener or amateur exhibitor who craves for money prizes cannot be much less selfish than that of the nurserymen.

The chief features of the show were the collections of Orchids, Clematis, Rhododendrons, Filmy and other Ferns, hardy herbaceous plants, flowers and fruits. It would be impossible to mention here a tithe of the interesting things shown; indeed, almost every plant of the thousands there had something special to commend it. H. R. H. the Prince of Wales opened the exhibition and spent a considerable time in inspecting the plants and flowers. He afterward expressed his unqualified delight with all he saw. Those who sympathize with the Society in its efforts to win back the influence for good that it possessed some years ago will know how to appreciate the work of the present Council.

Mr. Bull's annual exhibition of Orchids has become an institution in London. Mr. Bull was, I believe, the first to devote a portion of his nursery to an artistic arrangement of Orchids and foliage plants on the same lines as govern ordinary plant-shows. All regular customers and persons interested are invited by card to inspect the show, which continues two or three months in summer. The ordinary time-killer is excluded by a charge for admission, an arrangement found necessary to prevent the houses from being filled with idlers and those people who rush to see anything and everything. The collection of Orchids in Mr. Bull's nursery is one of the richest in England. There are, also, many rare and beautiful Palms, Aroids, Ferns, Bromeliads, etc., to be found in his establishment. With the aid of these Mr. Bull is enabled to make a most attractive display of flowers and foliage. It is, of course, a trade advertisement simply, but it is a most charming picture, nevertheless, for those who are interested in plants, and who find pleasure in looking at a well grown specimen of a beautiful plant, whether in a nursery or in a private garden.

London.

W. Watson.

Cultural Department.

Notes on Shrubs.

THERE are no hardy *Viburnums* which possess more beautiful or interesting flowers than the native Cranberry-tree (*V. Opulus*), also indigenous to Europe and the northern part of Asia. Specimens in the Arboretum raised from seed collected in the mountains about Peking, China, do not show any sufficiently marked variations from our own to entitle them to a separate specific or varietal name.

The large, sterile, marginal flowers in the flat cymes become conspicuously white a few days before the perfect flowers open, which, in ordinary situations in gardens, occurs here about the 1st of June. It is always remarked that the natural species seems much less liable to attack by Aphides than the Snowball or Guelder Rose, which is but a monstrous form of the Cranberry-tree. This susceptibility to injury may be because the sterile Snowball, being perpetually propagated by cuttings, layers or similar modes of division, is less robust and less able to overcome attacks by insects than the fruit-bearing type, which is generally renewed by seed. Where Snowball-bushes are much infested by Aphides the thorough application of kerosene emulsion or a strong decoction of Tobacco will be effectual in destroying them. But it is very important that the insecticide should be sprayed upon the under side of the leaves with considerable force, so that it will penetrate into the folds of the twisted leaves, where the insects are concealed and the work of injury is carried on.

The Japanese Snowball (*V. plicatum*) is to be recommended for its freedom from disfigurement by these troublesome insects; but aside from this quality, it is valuable for its own peculiar beauty. The common Snowball is a more graceful, freer growing plant, which bears its balls of flowers on somewhat pendulous branches, while *V. plicatum* is a rather formal

shrub, bearing its blossoms on short, rigid, lateral twigs. The rough dark green leaves harmonize with the stiff character of the plant and form a beautiful, though scanty, setting for the profusion of snow-white flowers usually produced. These are arranged in more compact and more evenly round "balls" than those of the common species, and they seem of a purer white color. The character of the two species is so different that they should both be grown if possible, but in a small garden, where there is only room for one, *V. plicatum* would generally give the most pleasure. It should be stated, however, that *V. plicatum* is not so stubbornly hardy as the common Snowball, although it thrives very well in good well drained soil in the latitude of Boston. Both species blossom at the same time, but the Japanese Snowball retains its beauty the longest.

Far larger and more handsome than the flowers of either of the preceding species are the large Hydrangea-like clusters borne by *Viburnum macrocephalum*, a form of a Chinese species of long cultivation in Europe, but whose wild type, with a very few sterile outer flowers, has only recently become known to botanists. The individual flowers of the sterile form are very large, and the clusters or "balls" so great and weighty as to hang like a burden on the plant. This is not so hardy as either of the preceding species, but it can be grown in the climate of Boston.

Of all Viburnums in the Arboretum, the native Hobblebush (*V. lantanoides*), which was figured on p. 535 of the first volume of GARDEN AND FOREST, is the earliest to flower, the blossoms expanding during the first days of May. A week or ten days later the earliest flowers of the European Wayfaring-tree (*V. Lantana*) open, and about May 20th the Black Haw (*V. prunifolium*) comes into blossom with large, flat, compound cymes of small whitish flowers. The last species is not very hardy about Boston, yet in a very favorable location it will become a small tree. It is as pleasing on account of its bright shining green leaves as for its flowers, which are of short duration and closely imitated in effect by those of the Sweet Viburnum or Sheep-berry (*V. Lentago*), a larger growing, perfectly hardy, well known native plant, which comes into blossom a few days later.

Viburnum cotinifolium, a shrubby Himalayan species, comes into blossom during the latter part of May. The leaves of this are soft and downy and have a resemblance to those of *V. Lantana*, but the flowers differ in being arranged in a smaller, much more convex cyme. The small corollas are of a delicate pinkish white color and have an appearance suggestive of dainty porcelain. The anthers just before shedding pollen are conspicuously large and yellow. The plants at the Arboretum need a good deal of protection in winter, but they are fairly hardy in more favorable conditions. *Viburnum Sieboldi* (sometimes *V. Japonicum* in nurserymen's catalogues) is a coarse growing Japanese species which blossoms at the end of May or in early June. The small white flowers in large, flat, rather loose cymes look much like those of Elderberry. The leaves are large, thick and rough, and when bruised they emit an odor quite disagreeable to most people. Fruit is produced sparingly here, but strong, vigorous plants are procured by grafting on stock of the Arrow-wood (*V. dentatum*), a common native species which does not begin to bloom until the middle of June. *V. pubescens*, another native species, is earlier and loses its flowers by the time those of the Arrow-wood open. As ornamental plants in a shrubbery both of these species are superior to *V. Sieboldi*, which may be called more peculiar than beautiful.

The Withe-roads (*V. nudum* and *V. cassinoides*) are so closely alike as to be identical so far as their horticultural value is concerned. They are perfectly hardy native plants of great use in shrubberies and for covering waste places. They bloom with the equally useful but more graceful and pretty *V. acerifolium* near the middle of June. The last species of Viburnum to blossom is *V. molle*, a plant of generally southern habitat, but which is also found on Nantucket Island, the mildest spot in Massachusetts. It is quite hardy. In foliage, flower and general appearance it closely resembles *V. dentatum*, which under the influence of the cool breezes of Cape Ann, only an hour's railroad ride to the north of Boston, blooms a couple of weeks later than it does near this city.

Arnold Arboretum.

J. G. F.

Some American Plants.

Aristolochia tomentosa is a twining and climbing perennial of the same genus as the Pipe-vine or Dutchman's-pipe (*A. Siphon*), and resembles it in many ways. The flowers of *A. Siphon* are larger and a little more showy, but are of about the same shape. The most striking difference is in the size of the

leaf. In *A. tomentosa* they are about five inches long by four broad and somewhat downy. But in the other, though of almost the same shape and shade of green, they are often a foot long by eight inches wide. These large green leaves are so numerous in both plants as to hide both flowers and stems. Both are natives of rich woods in the northern portion of the southern states. They seem to thrive in light or in heavy soils in the sun or shade, and are quite hardy in this latitude.

Adlumia cirrhosa (the Climbing Fumitory) is a delicate climbing biennial, not rare in moist or wet woods. Its foliage and flowers are both very neat, and it is a pity that it is not perennial. When near a bush or something to which it can attach itself it often attains several feet in height, and its drooping panicles of light purple flowers are continuous from June until October. It needs a light soil, and thrives in both sun and shade.

Zygadeus venenosus, from the Pacific coast, has a bulbous root and long grass-like leaves. Its flowering stem is usually a foot or more high, almost naked, and bears at the summit a dense short panicle or head of nearly white flowers a third of an inch wide, and having a yellowish centre. It is perfectly hardy in this climate, and will do well in light or heavy soil in the sun.

Oxalis violacea, the Violet Wood-Sorrel, is one of our prettiest wild flowers at this season. It is sometimes found in southern New England, but is more common southward and westward. It generally grows about six inches high, bearing several large violet flowers nearly an inch wide, which are very showy. It can easily be grown in the shade or in a cool partly shaded situation. A light soil suits it, and if it is to be set in a heavy one peat or leaf-mould should be added.

Brodiaea multiflora and *B. coccinea*, both from the Pacific coast, come into flower at about the same time. Both have bulbous roots about the same size, with long naked stems and grass-like leaves from the bulb. Their stems are each about a foot and a half high, with their flowers in an umbel at the summit. They are often found growing together, and the bulbs are so near alike that collectors frequently get them mixed if taken up when not in flower. But though resembling each other in these points, they are very unlike when in flower. In *B. multiflora* the flowers are upright, half an inch wide, three-fourths of an inch long, and bluish purple in color, borne in a close round umbel and on very short pedicels. The flowers of *B. coccinea*, on the other hand, are drooping, on stems from half an inch to an inch and a quarter long. The flowers themselves are usually an inch or more in length, tubular in shape, and about a third of an inch thick. In color they are deep scarlet for nearly the whole length, or except a short space at the mouth, which is green and white. This last is a very striking plant and valuable for cut flowers. We have the best success with both of these and most other Californian bulbs by setting in autumn and protecting with a covering of leaves. When wintered in a cellar they are inclined to start into growth about the last of February, and this early growth in the cellar weakens the bulbs. They like a fine, well-drained soil and open sunlight.

Brodiaea stellaris is a little, dwarfish species, only four or five inches high, bearing a small umbel of four to six pale blue flowers, with darker stripes. The flowers are a little more than half an inch wide. It is a pretty species, but its stems are too short for cutting.

Brodiaea lactea has almost white flowers, with greenish stripes. The flowers are half an inch wide, in an ample umbel on a naked stem a foot and a half high. Both of these last mentioned should be treated in cultivation like *B. coccinea*.

Tradescantia Virginica, the common Spiderwort, which has been long in cultivation, is a native of moist woods from western New York southward and westward. It is a strong-growing plant, and soon forms dense clumps fifteen to twenty inches high. The flowers are blue, an inch or more wide, with large yellow stamens, which contrast finely with the blue background of the flower. It is easy of culture and is a valuable plant for a shady corner.

Lilium Bolanderi is a rare species from Oregon, growing from six to twelve inches high, with dark red flowers, having darker spots inside. The flower is a little more than an inch long and about as wide. All the specimens I have seen produced only one terminal flower, and the stem is recurved so that the flower is turned downward. It is one of the smallest species and quite pretty. A light loamy soil seems to suit it best.

Allium acuminatum, from the Pacific coast, is usually a low plant, six to eight inches high, with a good-sized umbel of pretty rose-purple flowers. The flowers are half an inch long and about as wide at the opening, on pedicels three-fourths of an inch in length.

Callirrhoe involucrata, the Crimson Callirrhoe, a plant from the sandy plains of Texas, is beginning to bloom. The flowers are sometimes two inches wide and a dark crimson in color. It is a prostrate, spreading perennial, with stems sometimes two feet long. But these long stems, though creeping on the ground, do not themselves take root. The flowers, which are on upright naked stems from four to eight inches long, continue to come all summer. It is perfectly hardy, will do well in light or heavy soil, and is certainly one of our most interesting native plants.

Sedum Nevii is a native of the southern Alleghanies. Its dense leafy stems are usually only two or three inches high,

should be the most valuable on account of the fruit. It is occasionally found in thickets from New England to the Mississippi River, and is more common southward. It needs time to become established, and plants two years old or more have larger and handsomer leaves and fruit.

Southwick, Mass.

F. H. Horsford.

A Few Good Forms of Ficus.

THIS extensive and varied genus contains many species that are both useful and beautiful. It not only includes the common Fig (*Ficus Carica*) and the wonderful Banyan-tree (*F. Indica*), but also a number of our most serviceable stove



The Oldest Locust-tree in Europe.—See page 305.

very even, and form a solid mass of light green foliage, which is very pretty. Its flowering-stem is not so leafy, and rises two or three inches above the rest of the plant, bearing a small three-spiked cyme of white flowers, which much resemble those of *S. ternatum*, but it is fully two weeks later. It is a prettier plant than *S. ternatum*, and can be grown without protection in sun or shade. We have never tried it in a heavy soil.

Dioscorea villosa, the Wild Yam-root, is a twining and climbing herbaceous perennial. Its large handsome leaves are often five inches long by three and a half inches wide, prominently several ribbed, and downy underneath. The flowers are not showy, but the drooping racemes of three-angled pods are very interesting. It is a striking plant, admired by all who are interested in this class, and for shady or half shaded situations is invaluable. It is dioecious, and the female plants

and greenhouse plants. It is almost needless to call attention to the best known species, *Ficus elastica*, its merits as a generally useful decorative plant being so well understood and recognized, and the variegated form of this species has also been commended by various correspondents of GARDEN AND FOREST. Without doubt *Ficus elastica variegata* will take rank among standard decorative plants as soon as the stock becomes so abundant that well grown plants may be procured at a reasonable price.

Another very handsome variegated species is *F. Parcellii*, which has dark green leaves, beautifully marbled and blotched with pure white. It is a plant of good habit and free growth, and quite naturally attracted much attention when first introduced from the South Sea Islands several years ago. This species should have a warm house temperature and a moist

atmosphere, because when allowed to become too dry it is liable to injury from red spider. Among the large-leaved species, *F. macrophylla*, the Moreton Bay Fig is prominent, its large cordate leaves giving quite a tropical effect in the conservatory, and also being very effective for out-door decoration in the summer. It is a strong grower, and soon makes a large specimen.

Ficus dealbata is another notably good large-growing species, and has leaves of somewhat similar shape to those of *F. elastica*, but dark green on the upper side, while the under surface is thickly clothed with pure white tomentum. It was introduced from South America a number of years since, but has not become very common, possibly because it does not root as readily as some other species.

Ficus Porteana also deserves a place among fine foliage plants, having oblong, sharp-pointed leaves from one foot to eighteen inches in length and from four to five inches in breadth, and slightly serrate on the margins. The leaves of this species are not quite so tough and strong as those of *F. elastica*, but they have substance enough to render it very useful for conservatory work. It is a native of the Philippine Islands, and produces its finest foliage when grown in a warm house.

In the scandent section of the Fig family are to be found some of the most useful greenhouse climbers, prominent among which are *F. barbata* and *F. stipulata* (*F. repens*), the first named being much the stronger of the two, and producing dark green, cordate leaves about three inches in length, and more or less clothed with brown hairs. This species, like *F. stipulata*, is especially useful for covering a wall in a warm house, as it adheres very firmly, and, when given congenial treatment, soon covers such a locality with a most pleasing green mantle. *F. stipulata*, and its variety, *Minima*, are not so particular as to locality and treatment, and may be put to a variety of uses besides that referred to above, being readily propagated and of rapid growth.

The various kinds of *Ficus*, in general, are very clean plants and not subject to the attacks of insects, unless much neglected. They are propagated by means of cuttings made from firm wood, many of the sorts rooting best from single eye-cuttings, which should be firmly planted in small pots and tied up to a small stake, so as to prevent them from falling out of the pot on account of the weight of the leaf.

And while they root best in a close frame, yet enough ventilation must be given at night to prevent the accumulation of much moisture on the cuttings, else they are liable to damp off. Sandy loam, slightly enriched with old manure, will be found a satisfactory compost, and with reasonable care handsome plants may soon be obtained.

Holmesburg, Pa.

W. H. Taplin.

Crown and Root-Grafts.

I AM glad to see this distinction clearly made by Professor Bailey and others at the Nurserymen's Meeting. Any one who grows his Apple-seedlings for grafting, and grows them well, knows that they will be too long to be used entire, so that the claim often made that trees are grown on "whole roots" is misleading. The roots must be shortened and side-roots removed. The question then remains, whether we shall use any more of each root than the crown section? I have been testing the matter for many years, and carefully noting results. There are elements of great uncertainty in these tests, unless much care is used and sufficient time allowed for observation. Even if the crown is best, crown-cuts are not all equally good; cions are not all equally good; the soil is not always uniform, and other disturbing conditions are possible.

My experience with Apple-seedlings has been that if plump, vigorous seed is used, and properly planted in good and suitable soil, yearling roots are better than older ones. We then have yearling wood in the stock joined to yearling wood in the cion; the size of the stocks is more nearly that of the cions, often allowing the bark to join all around, and the wood of the stock is softer and more easily cut. Two-year stocks are either too large or of inferior growth and quality.

In our climate it has been found a wise plan to plant our grafts deeply, so that but one bud of the cion is above ground—using cions of three buds or more. In this way, from many varieties we can get good roots from above the point of union. When sufficient care is taken in all points I have never seen any marked difference in growth, in nursery or in orchard, between the first and second cuts of well grown and carefully selected roots which could be charged positively to the roots. It must be remembered that we are apt, while at work, to put the larger cions on the top cut, leaving the smaller for the second cut, so that the completed grafts of the latter are some-

what less in size. But, even allowing all that is required here, I am not able to say that alternate rows of first and second cut grafts have ever, in my nursery, shown sufficient difference at the end of the third season to be discriminated with any certainty. So I must conclude that, with good work all around, it is allowable to use the second cut. But with careless work and unsatisfactory material the result might not be the same.

As to the preference for budding over root-grafting, I find many buyers who object to the crook in a budded tree and prefer the straighter root-graft. But aside from this, where iron-clads are demanded, we want none of the stock above ground or near the surface, as must be the case with budded trees.

I can see no reason why trees root-grafted should have roots on one side only. It may happen that an occasional tree will show that peculiarity, but when this occurs so very seldom who can be sure of the cause? I should be most apt to regard it as a peculiarity of the seedling stock. Neither have I noted that the roots of root-grafts are more pronged. Observing nurserymen soon discover that nearly every variety has its own style of root, which is determined by the cion, so that many varieties can, when taken up at three years old, be known by their roots alone. The spadesmen notice this very quickly when digging, and have a ready anathema for certain varieties with a vigorous, deep-going root system.

Newport, Vt.

T. H. Hoskins.

Notes About Blackberries.

KITTATINNY I had thrown out as too tender, although when I did get a good crop it was a very excellent and paying berry. But it did not stay thrown out, so I have adopted the plan of bending the canes over and holding them down in winter with stones or boards. The result is excellent crops on a small scale. The fruit is large and glossy, and good if well ripened. But there must be some of the caution used that was needful in the case of Lawton. It must be well ripened before being picked.

Wachmett Thornless is not thornless, and is not a berry with a single point in its favor for general planting. There may be localities where it is valuable.

Wilson Junior is only an improved Wilson, and very tender indeed. It will come through if covered with snow; but even if bent down and held close to the ground it will kill to the roots during open winters. It is worthless in a northern latitude.

New Rochelle or Lawton is also worthless, except south of New York. Dealers have a habit of calling all improved Blackberries Lawtons. We cannot as yet get any rational distinctions made in this regard.

Taylor is a real acquisition. The size is above medium and the quality very good. The growth is strong and it is among the most productive. It is later than Snyder.

Snyder is a much better and larger berry than was supposed for a long time. Cut the canes back and select a cool, strong soil and it is a prize. On poor soil and where easily affected by dry weather it is too small to be of any value. In quality Snyder is really very good, not sour and not sweet.

Early Cluster and Crystal White, with me, are tender and otherwise valueless.

Erie I hold in the very highest esteem. It has gone through three winters unharmed, and gives a superb crop of very large and very excellent fruit. The color is a peculiar jet black, unlike that of Lawton, with which it has sometimes been confused. I believe a large amount of swindling has been done in sending out Lawton for Erie.

Minnewaski, so far as I have tested it, proves to have all the good qualities claimed for it—a large, handsome and early berry, and a cane not so strong as some, but entirely hardy.

Agawam is another excellent sort, not so large as Erie or Minnewaski, but with me an excellent fruit and a hardy cane. It bears grand crops, and no one is ever cheated by it into biting an acrid berry that he cannot swallow with honest regard for his stomach.

I would select as a list for a home garden Erie, Agawam, Taylor, Minnewaski. Confined to two sorts, I should perhaps take Erie and Agawam; but should not like to miss Taylor.

For market the same list might still hold good, with Snyder added. The Blackberry has been improved far more than is generally known. The Kittatinny caused great disappointment, and led many growers to discard Blackberries entirely from their grounds.

I grow with cultivation for two or three years, but let the plants ultimately take possession of the soil and care for themselves. They do best let alone. Cut out the dead canes, and

cut back the new ones. Weeds and grass will not hold their own with Blackberries in good soil.

The Lucretia Dewberry has been advertised well, and is really a superb fruit; but it must be laid down for winter. The fruit is enormously large, very early and excellent. It can only be grown well by being tied to stakes and bent back to about three feet of iron.

There are two drawbacks to Blackberry culture which seriously mar our pleasure and profit. The first difficulty is with the cruel thorns. Women cannot gather the fruit without having their clothes torn to rags. The rust is another serious trouble. The remedy for this fungus is to cut and burn. I should not try to cultivate any sort that rusted to any extent. With me Kittatinny alone is diseased, and that rarely. This rust is a mischievous malady, and it is not advisable to propagate it. It is not confined to the Blackberry.

The kind of soil for the Blackberry is invariably dry, well drained, strong clay, if possible; but well drained it must be. If I intended to cultivate a plantation I should have the rows ten feet apart and a row of Potatoes between.

E. P. Powell.

Clinton, N. Y.

New Orchids.—A plant of more than ordinary interest is *Odontoglossum hybridum Leroyanum*, the first hybrid *Odontoglossum* raised artificially. Its parents are *O. crispum* and *O. luteo-purpureum*, which were crossed about five years ago by M. Leroy, gardener to Baron E. de Rothschild, in his garden at Amandvilliers, near Paris. The hybrid flowered in May this year, and proves its origin by combining the characters of the two species named. Mr. Sander will shortly publish a figure of it in *Reichenbachia*. Many have obtained seeds, and even seedling *Odontoglossums*, by crossing one species with another, but they have never come to anything.

Odontoglossum Bleu *splendens* is another hybrid, its parents being *O. vexillarium* and *O. Roezlii*. Properly, however, the three should be called Miltonias. This hybrid also originated in Paris, where it was raised by M. Bleu. Its flowers are as large as those of an ordinary *O. vexillarium*, white, tinted with rose, with a crimson blotch at the base of the labellum, and radiating lines of the same color extending a little out toward the margin. It is a curiosity as a true hybrid *Miltonia*, otherwise it is scarcely equal to a good variety of either of its parents. It is in the collection of Mr. F. Sander.

Phajus Henryi appears to be merely a rose colored variety of *P. Humblotii*. Probably the two are the extreme color variations of one variable species. Plants of both were shown in flower by Mr. Sander at the Temple Show. *P. Humblotii* is likely to prove a good garden Orchid, as it grows freely and flowers well.

Kew.

W.

Sagittaria Chinensis was received from a Chinese laundryman early in the year as an egg-shaped, whitish tuber with a short sprout. It was planted in a bowl of earth and kept saturated with water, and proved a very rapid grower and attractive plant a foot high, with light green foliage and the many arrow head leaves rather broad. Removal to an outside tank has checked its growth and flowering so that it is not possible to say whether or not it is *S. Latifolius*, the only Chinese species which can be found in catalogues. Special interest was excited in this plant from a hope of discovering that our Chinese friends, with their materialistic reputation, were not without some of that sentiment which has led emigrants in all ages to take with them some favorite plants as a reminder of their birthplace. We are already indebted to them for the Water Narcissus or "Sacred Water Lily," apparently first brought here without hope of gain, and it seemed as if the *Sagittaria* might be an introduction of another favorite home plant. This theory I regret not being able to verify, as my interviews with growers of the plant in the Chinese colony simply proved that they grow the plant, but with no great enthusiasm, such as they evidently feel about the "Sacred Lily." A Chinaman is not usually an open hearted enthusiast, but I found a number of them in humble quarters become bright-eyed and vivacious over the Narcissus. Lately the street fakirs have offered dormant tubers *Sagittaria*, but of what variety is unknown to me.

Tulipa ciliatula.—This is the name I find given by Mr. J. G. Baker to a new Tulip which he describes in the *Gardeners' Chronicle* for May 24th. I received it directly from Mr. Whitall, who collected it on the Anti-Taurus Range in Asia Minor, and sent it out last year. With me it came into bloom in the open border in April. It is nearly allied to *T. Gesneriana*, with the same bright crimson-scarlet petals, and glaucous, undulated foliage. It is of very dwarf habit, the peduncles being only two

inches long, and is an excellent plant for bright bedding or for the rockery.

Oenothera Fraseri is one of the best of the Evening Primroses. The flowers are light golden yellow, borne profusely on a dwarf plant a foot high, which remains in bloom for several months. It is a native plant long in cultivation. The fields are now bright with *Oenothera biennis* and Dog Roses, and it may be noted that for a bright bouquet there are few more pleasing combinations than these two flowers, loosely arranged.

Iris lævigata opened its first bloom on the 15th of June, on the borders of the pond, where they seem to be about a fortnight earlier than in a dry and somewhat shaded border. There are handsomer flowers among the Irises than Kämpfer's, but these have a quaintness and a grace of their own. The varieties with dark reticulations are specially quaint, and good white forms are very pleasing. It is interesting to grow this plant from seed, as it comes into bloom in two and three years.

Elizabeth, N. J.

G.

A Good "Cutting" Lettuce.—The French works on gardening describe a class of so-called "cutting Lettuces," of which a distinguishing characteristic is that if the leaves are plucked from the plant one by one others will develop to take their places, and thus a single planting will continue to furnish a crop of leaves through nearly the whole season. I have tested these Lettuces and found none of them to be of the finest quality, all being too bitter to suit our American taste. It may not be generally known, however, that some of our best common Lettuces, when given good soil and culture, will furnish several successive crops of foliage without running to seed, if the leaves are picked off one at a time, and are not drawn upon too largely. I have grown the Prize Head Lettuce in this way during the past two seasons with excellent results. A bed covering a few square feet furnishes sufficient lettuce for daily use during several successive weeks.

University of Wisconsin.

E. S. Goff.

Correspondence.

Appropriate Bridges.

To the Editor of GARDEN AND FOREST:

Sir.—You can do no better work, I think, by means of the charming illustrations you publish, than to continue to show American readers what good rural bridges should look like. There is a growing desire in this country to build substantial bridges and to make them beautiful as well as solid. But often there seems no realization of the fact that beauty means appropriateness, or, at least, no true feeling for what is appropriate and inappropriate. For example, while passing through Connecticut by rail the other day, I noticed in one of the smaller towns (was it in Milford?) a small stone bridge, spanning a stream close to the railroad, which seemed to have been recently built. Although neither long nor high and placed in a modern town of modest aspect, where most of the neighboring buildings were of wood, this bridge has crenellated sides, and, at one end, a circular turret, whose top, as I remember, was similarly protected against impossible enemies. In itself it was not beautiful, looking sadly like the *papier-maché* fortifications of the scene-painter. And could anything more inappropriate be imagined in a New England town of to-day than a battlemented bridge, suggesting the conditions under which people lived in other lands in mediæval times? Of course, the cost of such a structure must have been much greater than that of a simpler stone bridge, and every penny of the difference had been worse than wasted, producing a thing which was not beautiful in itself, and which looked still less so by contrast with its surroundings.

Philadelphia.

Viator.

The Paragon Chestnut and The Crandall Currant.

To the Editor of GARDEN AND FOREST:

Sir.—Referring to your report of the Nurserymen's Convention, page 292, allow me to enquire (1) whether the Paragon Chestnut was not propagated from grafts furnished by my late neighbor, Mr. W. L. Shaffer.

Mr. Shaffer's tree was from a Spanish Chestnut.

(2) Again, what is the difference between the Crandall Currant and the Utah Black and Utah Yellow Missouri Currants, which have been under cultivation for twenty-five years, and were originally distributed by Siler, Reading and others?

Germanstown.

Thomas Meehan.

[1. Perhaps Mr. Van Deman was incorrectly quoted as saying that the Paragon Chestnut is of "purely native origin."

In the Report of the Secretary of Agriculture, just issued, he says: "It is possible that this variety may have some foreign stock in it, as the leaves differ slightly from those of our native species." Mr. Engle received the grafts from Mr. Shaffer under the name of Great American, and he changed it to Paragon because he feared the first might be misleading. He knew nothing of its origin, but supposed it might be a cross between our native Chestnut and some foreign variety, since the flavor is nearly equal to that of our own Chestnuts, while the nut is as large as the foreign sorts. We should be glad to have further information as to the parent tree. A good illustration of the nut appears in the report of Mr. Van Deman.

(2) Professor Bailey, who has recommended the Crandall Currant highly, is not acquainted with the Utah Currants spoken of, although he has heard of them. Mr. A. S. Fuller commends these Utah forms in his "Small Fruit Cultivist;" but he is unacquainted with the Crandall. We should be obliged for a report on the comparative value of the Crandall and these older introductions from any one who has tried both.—Ed.]

The American Association of Nurserymen.

Fifteenth Annual Meeting.—III.

THE papers which follow conclude our report of the late Convention of Nurserymen in this city. The next Annual Meeting will be held either in Minneapolis or St. Paul, as may seem best to the Executive Committee.

THE CULTIVATION OF THE CHESTNUT.

Mr. Samuel C. Moon read the following paper on this subject:

Chestnut culture in orchards is a young industry in this country, and although it has already been proved to be profitable, the subject is as yet imperfectly understood. The Chestnut-tree is widely distributed throughout the country, and yet there are large districts in which it is not found, and the question is often asked whether it will grow on bottom lands or on limestone lands? I cannot reply to these questions, and would be glad if some experiment station would investigate this subject. In Arthur Bryant's book on forest-trees it is said that "the Chestnut seems to prefer the sides and neighborhood of hills and mountains with a dry sandy or gravelly soil, although it will grow on almost any soil except a wet one. It does not appear, however, to grow more rapidly in the rich soils than on the poorer lands. Lands utterly worthless for cultivation may be made to yield an income by planting them with Chestnuts."

No trees which are equally well adapted for avenues will yield any return like our native nut-bearing trees, and none are more appropriate for shade and ornament about buildings or along farm lanes or in pasture fields. In planting the Chestnut, whether in orchards or avenues, the trees should be set at least forty feet apart, and some varieties will need forty-five or fifty feet. Like other fruit-trees, they should be mulched, or the land should be kept mellow about them while they are small, and they will come into bearing as soon as Apple-trees or Pear-trees. Wild trees usually commence bearing when from twelve to twenty years old, and grafted ones of the most productive varieties from two to seven years after grafting. A Chestnut-orchard of the Numbo or Paragon varieties will come into bearing condition as soon as an orchard of Baldwin Apples. Both of these varieties possess the qualities which make any orchard-fruit profitable—that is, hardness of the tree and early fruitfulness, with large size and fine appearance of fruit.

Efforts to introduce the Maron de Lyon and other large European varieties have not been successful, for although the trees may live a few years, they ultimately die. Trees imported from Europe, and trees grown here from imported seed, are not generally hardy; but stock raised from the seed of the exceptionally hardy European trees that do flourish here have proved hardy themselves, and in this way a strain of European Chestnuts has been secured which will endure the climate of the eastern states. Many individual native trees in different parts of the country have local reputation for superiority, and are no doubt worthy of dissemination, but they have never been introduced, and, like other new fruits, will need to be tested in different sections and under varied conditions before they can be confidently recommended. As the demand for new and improved varieties develops there is

little doubt but that superior kinds will be found and disseminated.

In habit of growth the American Chestnut differs from the European about as the Sugar Maple differs from the Norway Maple. The foreign Chestnut branches low and forms a round-headed tree, while the native variety grows taller and more spreading. The Japan Chestnut seems to be smaller than either of the others, with smaller foliage, and its slender, compact habit makes it an acquisition for small plantations. None of the large Chestnuts, and no foreign Chestnut that I have seen, equals in flavor the small ones on our native trees when they are eaten uncooked. They lack the sweet and delicate taste with which we are familiar, and there is an astringency in the skin which covers the kernel, but boiling or roasting corrects this unpleasantness, and after being cooked there is little difference in the taste of the foreign varieties and our own. When the culinary uses of Chestnuts are appreciated here as they are in Europe, where the cooks prepare them in a variety of ways, the demand for those of large size will rapidly increase.

I find the Chestnut an expensive tree to raise, and this cost of production is an obstacle in the way of its general cultivation. I have found difficulty in grafting the trees and loss in transplanting them. It has not paid to graft them until after they are once or twice transplanted and when the stocks are three, or, better yet, five years old. My most successful take of grafts yielded seventy-five per cent. of saleable trees, but I have more frequently had seventy-five per cent. of failure. I have tried taking up one year's seedlings and grafting at the collar as Apples are worked, on whole roots. I have tried collar-grafting of one-year-old seedlings as they stood in the nursery row, using ordinary tongue-grafts, but with no success. I have failed also entirely with ordinary budding. I have been most successful when I cut the cions early in spring and kept them dormant in an ice house until the stocks started and the buds on them were well swollen. My practice then is to cut off the tops and insert tongue grafts wrapped in waxed muslin in the ordinary way. In some cases the grafts do not unite well and there is no perfect union between stock and cion. Such trees, of course, are short lived and worthless. This defect is more common with some varieties than others. I have one valuable variety that I have never yet succeeded in grafting. Three years ago I headed in a large European Chestnut tree with fifty grafts of the Japanese variety and every one took and looked well. This year, however, I found the unions all imperfect and they will evidently soon decline.

The difficulty of successful transplanting seems to lie in the extreme sensitiveness of the roots to exposure and their slowness in re-establishing themselves in the soil. If the roots get at all dry the vitality of the tree is wasted by evaporation before they become sufficiently established to supply the demand upon them. I therefore dig and handle Chestnut-trees on damp and drizzling days and puddle the roots as soon as they are dug. These difficulties are annoying but I do not consider the obstacles insurmountable. What is needed is extra care in every part of the work of handling the trees, from the time the seeds are sown until the grafted trees are set in their permanent positions, and I believe that after intelligent effort and experiments have been made by a large number of practical nurserymen in this direction, means will be found by which the trees can be produced as rapidly and cheaply as they are needed.

In the discussion which followed it was explained by Mr. Fernow that the Chestnut is not so particular about the chemical composition of the soil as about its mechanical condition. Where the Chestnut does not thrive on limestone land it is because the solid rock not far below the surface obstructs drainage. In limestone lands where there is an open, permeable subsoil the Chestnut flourishes. The same causes sometimes exclude the tree from alluvial bottom lands. To attain the best growth it needs deep, free and open drainage.

HARDY PERENNIALS.

Mr. J. W. Manning, Jr., of Reading, Massachusetts, read a paper on the question whether it is desirable for nurserymen to include hardy herbaceous plants with the trees and shrubs to which their business in this country is generally confined. Mr. Manning replied by saying that a few years ago there was little to encourage nurserymen to cultivate this class of plants; but that a great change had taken place in the character of the material used for ornamental planting. Old-fashioned plants which gave abundant flowers from spring till autumn in a succession of bloom were again coming into favor. They had been for some years removed to the background, and their places had been occupied by stiff arrangements of bedding

plants. These plants were expensive to keep through the winter, and required great care, and produced, after all, an effect which covered but a few months in the year, leaving the spring and autumn garden bare and empty. The return to a more natural style has brought into prominence these hardy plants, many of which are quite as brilliant in foliage as the bedding plants which they are replacing. We are by no means confined, however, to plants which flourish in old-fashioned gardens, for an increased knowledge has brought into cultivation hundreds of beautiful plants from all the temperate and mountainous regions of the globe until there is abundant material for beautiful floral effects, from the earliest spring until freezing weather, to be had with these hardy herbaceous plants, and while an ample variety of foliage and flower can be secured to suit every soil and situation and individual taste, less care and expense is required to cultivate them than is needed with the artificial bedding system.

The use of these perennials is not confined to the flower border alone; many of them are adapted for use on edges of shrubberies and in half wild situations so that large parks and public gardens can hardly be treated with proper landscape effect without using them in great abundance. It would be hard to treat rocky ledges, or shady nooks, or swampy lands, or the banks of ponds or streams without them.

Nurserymen were advised to begin at first with those that are most easily cultivated and propagated, avoiding weedy kinds and including in the main such as are of medium size and a long flowering season and having abundant bloom. A few of the taller kinds are indispensable for large effects, and a few of the exceedingly dwarf kinds are equally indispensable where a low creeping growth is needed. As a whole, no class of plants is more easily multiplied, and the only propagating apparatus needed is that found in the ordinary nursery business. They take up little room, and a large variety can be cultivated on a small area, so that the filling of orders is easily accomplished, and the work of digging and packing is a small item.

Mr. Manning concluded with a list of the hardy plants which were in greatest demand, but we omit it, as we give so much attention to this class of plants from week to week.

Periodical Literature.

IN the fourth of his "Artist's Letters from Japan," published in the June number of the *Century Magazine*, Mr. La Farge speaks more particularly about architecture and gardening. His chief text is the temple of Iyémitsu, which, like the more pretentious one of his grandfather, Iyeyasu, stands on the sacred mountain of Nikko. The purely architectural descriptions, marked naturally by the keenest artistic feeling for effects of light and shadow as well as for form and color in themselves, do not here concern us as much as those which show how inevitable in the Japanese mind nature and art are treated as a single entity, and to produce beauty means to blend the work of man in the most subtle ways with the work of God. The temple in question, says Mr. La Farge, is "fitted into the shape of the mountain, like jewels into a setting. From near the red pagoda of Iyeyasu's grounds a wide avenue leads, all in shade, to an opening, narrowed up at its end to a wall and gate, which merely seems a natural entrance between the hills. There are great walls to the avenue which are embankments of the mountain, from which at intervals fountains splash into the torrents at each side, and overhead are the great trees and their thin vault of blue shade. The first gate is the usual roofed one, red, with gilded rafters and heavy black-bronze tiles, and with two red muscular giants in the niches at the sides. Its relative simplicity accentuates the loveliness of the first long court, which we enter on its narrowest side. Its borders seem natural, made of nothing but the steep mountain-sides, filled with varieties of leafage and the columns of the great Cedars. These indeterminate edges give it the look of a valley shut at each end by the gate we have passed and by another far off disguised by trees. This dell is paved in part and with hidden care laid out with smaller trees." A cascade falling from the hill fills a large stone tank and "the little pavilion over this well is the only building in the enclosure. . . . As we turn to the highest side of the court on the left and ascend slowly steep, high steps to a gorgeous red gate above our heads, whose base we cannot see, the great Cedars of the opposite side are the real monuments, and the little water-tank upon which we now look down seems nothing but a little altar at the foot of the mountain forest. The gate, when we look back, is only a frame, and its upper step only a balcony from which to look at the high picture of trees in

shadow and sunlight across the narrow dell, which we can only just feel beneath us. . . . Just behind the gate, as if it lead to nothing, rises again the wall of the mountain; then we turn at right angles toward a great esplanade, lost at its edges in trees, from which again the forest would be all the picture were it not that further back upon the hill rises a high wall with a platform and lofty steps, and the carved red and gold frame of a cloister with another still richer gate of red lacquer, whose suffering by time has made it more rosy, more flower-like." This is but the beginning of Mr. La Farge's description of this shrine and its enclosures, but it is enough to show how nature and art intermingle, interpenetrate each other under the hand of the Japanese artist. More and more this impression is strengthened as further steps are taken through the varied enclosure, until we reach "the distant steps leading through the trees to the tomb. . . . surrounded by the still more solitary splendor of the forest," its bronze and lacquer and golden carvings contrasting with wild rocks and trees, grasses and mosses, and, when the winter shall come, standing unprotected amid the snow and storms. Such a scene, as the writer says, brings a feeling of humility and of the nothingness of man." It is as if these tombs said, "serenely or splendidly, in color, and carving, and bronze, and gold: 'We are the end of the limits of human endeavor. Beyond us begins the other world, and we, indeed, shall surely pass away, but thou remainest, O Eternal Beauty.'"

With humbler buildings the effect is the same—their surroundings form part and parcel of the design and it is impossible to say where nature ends and art begins. "What is natural," says Mr. La Farge, "and what was made by man has become so blended together, or has always been so, that I can choose to look at it as my mood may be, and feel the repose of nature or enjoy the disposing choice of art." Simplicity is the note of gardening art—small gardens needing few hands to keep them in order. Yet order means something much more artistic and particular than with us. Each day in the small garden near the writer's lodging "the gardener appears and attends to one thing after another, even climbing up into the old Pine-tree, taking care of it as he does of the Sweet Peas; and I recall the Japanese gardener whom I knew at our Exposition of 1876, as I saw him for the last time stretched on the ground fanning the opening leaves of some plant that gave him anxiety." It is pleasant to find that the estimate of the Japanese point of view as regards miniature gardens, which has more than once been theoretically explained in these columns, is here echoed by a keen observer who has made practical acquaintance with them and their creators.

The Japanese miniature garden, he says, "can be made of very slight materials, and is occasionally reduced to scarcely anything, even to a little sand and a few stones laid out according to a definite ideal of meaning. A reference to Nature, a recall of the general principles of all landscapes—of a foreground, a distance and a middle distance—that is to say, a little picture—is enough. When they cannot deal with the thing itself—when they can they do it consummately—they have another ideal, which is not so much the making of a real thing as the making of a picture of it. Hence the scale can be diminished without detriment in their eyes until it becomes Lilliputian to ours. All this I take to be an inheritance from China, modified toward simplicity." Mr. La Farge also notes that these little gardens cannot be appreciated by us as they are by the Japanese, "for they have in their arrangement manners of expressing ideas of association, drawing them from nature itself or bringing them out by references to tradition or history, so that I am told they aim to express delicate meanings that a Western imagination can hardly grasp; types, for instance, conveying the ideas of peace and chastity, quiet old age, connubial happiness and the sweetness of solitude. Does this make you laugh, or does it touch you—or both? I wish I knew more about it, for I am sure there is much to say." But, as the writer confesses, there are many points with regard to the artistic ideals of the Japanese where a foreigner cannot inform himself, whether it be because the full import is lost in the mists of antiquity, or because "they reserve it for better minds and worthier apprehensions." The most significant fact made plain in this delightful chapter of Mr. La Farge's is, we repeat, that architecture is not an isolated art, but one intimately involved with the love of nature and with the power of treating it in artistic yet naturalistic ways. A temple is not what we would understand by the name, but is a number of buildings of various kinds "spread with infinite art over large spaces, open or enclosed by trees and rocks. The buildings are but parts of a whole. They are enveloped by Nature, the principle and the adornment of the subtle or mysterious meaning which links them all together."

Notes.

Peaches, green apples, blackberries and huckleberries are coming into market from the Carolinas, and the first Wild Goose plums from California.

It is stated in *The Agitator*, published in Wellsboro, Tioga County, Pennsylvania, that a giant Hemlock was recently felled in Union Township, of that county, from which forty-nine four-foot lengths of bark were peeled.

The last part of *Hooker's Icones Plantarum* (xxi., Part 1) to reach us contains plates 2007 to 2025 inclusive, and is entirely devoted to the illustration and description of Indian Orchids of various genera, none of them of ornamental or horticultural importance.

Lonicera fragrantissima, which the past mild season brought into bloom in January in this vicinity, is named in an Austrian journal as a true winter-blooming species, the flowers of which are as fragrant during the snowy months as those of other Honeysuckles in summer.

A bark laden with 580 sticks of spar-timber from Oregon recently arrived in Boston. The cargo was valued at \$150,000, and a portion of it was at once purchased by a shipbuilder of Bath, Maine—a fact which shows how grievously the Maine forests have been denuded of their finest products.

A correspondent in eastern Massachusetts informs us that the Sycamore-trees in that region are all suffering from the disease described in our issue of last week; and that it is many years since they have been in such a deplorable condition as they are at present, although years ago they suffered to almost the same extent from apparently the same cause.

The *California Fruit-Grower* contains a colored plate of the new Rose, Rainbow, which was originated by John Sievers, of San Francisco. It is a sport from Papa Gontier. It is a pink rose splashed with the deeper color of Papa Gontier. It is said to be larger, firmer and more fragrant than its parent, and, besides being more productive, it is superior in its forcing qualities.

Le Journal des Orchidees, of which the sixth issue has now reached us, more than sustains the promise of the earlier numbers. It contains a large amount of practical instruction about Orchids and their cultivation of a character which amateur growers of these plants find most difficult to obtain, and which is conveyed through its columns in a plain and most satisfactory manner.

An ingenious berry-picking box is described by a writer in the *Orange Judd Farmer* as in use on a fruit farm in Wisconsin. It consists of a tin box just large enough to hold the quart box in which berries are sent to market. The lid is hinged, and in its centre is a small funnel through which the berries are slipped without injury or loss. A strap attached to the box fastens it to the body, leaving both the picker's hands free.

Just as this paper is ready for the press comes the sad announcement of the death of Patrick Barry, of the firm of Ellwanger & Barry, Rochester, New York. Occasion will be taken later to give some account of his eminent services to pomology and horticulture, but we cannot forbear in the moment we have at command to express our feeling of bereavement at the loss of this broad-minded and public-spirited man.

Mr. Alma-Tadema is known to pride himself almost as much upon the archæological accuracy as upon the beauty of his pictures of ancient Roman life. It is no wonder, therefore, that English journals are making merry over the fact that he recently introduced into one of them a representation of *Clematis Jackmanni*, as this now familiar plant is a hybrid variety produced about thirty years ago by Mr. C. Jackmann, of Woking, in Surrey.

The Ninth Annual Meeting of the American Forestry Association will be held in Quebec from the 2d to the 5th of September. All those who attend the meeting should procure receipts from the ticket-agents at the point of departure. Reduced return fares can be secured over roads connected with the Trunk-line Association, provided at least fifty receipts are presented at the meeting for endorsement. Further information can be obtained from Dr. H. M. Fisher, 919 Walnut Street, Philadelphia.

A machine for budding has been invented by Mr. W. M. Rowell, a young man living in Fort Meade, Florida. Mr. Rowell's budder, being "loaded" with a bud, plows under the bark, a pull on the trigger drives the bud in, and it is left in

proper position for binding. Mr. Rowell claims that 12,000 buds can be inserted in a day with his budder and that a child can learn the use of it in fifteen minutes. This implement is in some respects like a seed-dropper. The part that holds and inserts the bud is made of different sizes or numbers, adapted to different sizes of buds and stocks. By changing the points it may be used on stocks ranging from an inch down to nearly one-eighth of an inch in diameter.

Mr. C. R. Orcutt writes that the manufacture of syrup from the fruit of the *Opuntia* may at no far distant day become an important industry in southern California. *Opuntia Ficus-Indica*, or Indian Fig, *O. Tuna* and *O. Tuna-manse* have become naturalized around the old Californian missions. They are natives of Mexico and make rank and rapid growth. The juice of the fruit, which these plants produce in great abundance, may be extracted in a cider press like the juice from apples, and boiled down to a fruity syrup indistinguishable from that manufactured from the watermelon. Excellent vinegar may also be made from the juice. In Mexico these Cacti are extensively cultivated for their fruit.

So few places in the Central Park are disfigured by inappropriately placed formal flower-beds that the one near the Mineral Spring, to the north of the large sheep-meadow, is a surprising sight. A long, low rock lies here, beyond a narrow stretch of lawn, partly covered with Virginia Creeper and other vines and overhung by tall Sumachs, a Chestnut of shrub-like habit, and a Wild Cherry. No rock on the borders of a New England pasture could look more natural, yet close in front of it, following its outline, now lies a great bed set with Scarlet Geraniums, Coleus and Vincas, arranged in formal patterns. Fortunately, it is invisible except to those who pass along the somewhat unfrequented path, and one can only hope that it is not a prophecy of more numerous errors to come.

At the recent great horticultural exhibition in Berlin the prize for the finest Orchid grown in Germany was given to Herr Bouche, of Endenich, for a plant of *Cymbidium Lowianum*. But it is said that his success was owing to the rapid fading of a *Phajus tuberosus* exhibited by Herr Lackner, of Steglitz. This species had bloomed but three times before in England, and never on the Continent, and the plant in question was greatly admired in the brief period during which its flowers remained in good condition. One of the most remarkable exhibits was a collection of 250 species of Cactus shown by Herr Gruson, an amateur of Magdeburg-Buckau, which received the "prize of honor," a large silver medal given by the state. There were 634 exhibitors in the different departments of the display.

We learn from the *Pacific Rural Press* that the state of California has received from Mr. Abbot Kinney, of Lamanda Park, a donation of many thousand young forest-trees, reared at that gentleman's expense. In making this presentation he has selected the State Board of Forestry as the proper channel for the direction of them to the best uses. Such of these trees as are not required to perfect their own plantations will be distributed during the coming season to such applicants as will conform to the Board's request to furnish the customary reports as to locality planted, growth made, conditions observed, etc. In selecting the State Board as the medium for the dissemination of these trees, Mr. Kinney was doubtless influenced by the knowledge that the intelligent direction of the chairman of the Board, Hon. Walter S. Moore, to promote the cause of forest-planting would be fully exercised to insure such disposition of this gift as would result in the greatest benefit to the people of the whole state.

A few weeks ago one of the most interesting old houses in New York State was destroyed by fire. This was the Hogeboom homestead, at Claverack, near Hudson, known to recent generations as the "Watson Webb House." It was built by Jacobus Hogeboom in 1727 on a tract of land which his father, Kiliaen, had purchased from Chancellor Livingston. Its façade measured sixty-three feet and was adorned by a deep porch, while an immense Ivy had nearly covered both porch and wall. The interior was treated in the characteristic Dutch way, with carved and tiled mantels, and, it is said, mural paintings. Before the Revolutionary War broke out the house had come into the possession of General Watson Webb, who had married a grand-daughter of its founder. During a visit made by Lafayette he scratched his name and the date on a window-pane, which, of course, was thereafter guarded as a precious relic. And every child in America should regret the destruction of the mansion, since under its roof Moore wrote "Twas the night before Christmas."

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Horticultural Education.

A CORRESPONDENT referring to Professor Bailey's article upon the value of horticultural education, desires to be informed just what is meant by that phrase. It may be answered in a general way that one could appropriately be called educated in horticulture when he had an adequate schooling in the accepted theories of horticulture or in the sciences related to horticulture as distinguished from a mere familiarity with the practice or art of horticulture. Of course it is not expected that a young graduate will be an expert in chemistry, botany, entomology and all the other sciences which furnish explanations for the best garden practice, but he should have a rudimentary knowledge that will enable him to understand what explorers in each of these fields are looking for and finding, and to apply these discoveries to his daily practice. Above all, he should have the broadened intelligence, the more cautious and accurate judgment and the more alert and fruitful imagination which scientific training brings.

Now there is no specific course of instruction which would be the best for all who purpose to devote themselves to horticulture. The best training would vary according to the mental bias and capacity of the student, the particular branch of horticulture he wished to prosecute, and so on. It will be set down as established, however, that a fair general education is the best possible foundation for any special training. The course of agriculture in Cornell University, as we have learned from Professor Bailey, is based upon this idea. The two years of general training are meant to establish habits of study and direction of thought. They embrace a thorough training in English, with instruction in French or German or both, mathematics, elementary chemistry and botany, zoology, entomology, physiology and hygiene, physics, free-hand drawing and logic. Upon completion of the second year the student is allowed to make selections from optional studies. If he takes a course in general farming he selects studies

in that direction, or he may choose agriculture, chemistry, economic entomology, veterinary science and practice. He may also select studies from the purely scientific and literary course, but at least three-fourths of the work in the last two years must be devoted to subjects directly relating to agriculture.

If he selects horticulture as an optional study he pursues the study of botany in considerable detail, and he is then afforded the following courses:

1. Variation of Plants under Culture. A discussion of the principles which underlie the modification and amelioration of plants under the hand of man. The course includes the consideration of acclimatization, the modification of plants by latitude and climate, pollination and hybridization, selection, influences of soils and treatments, histories of cultivated plants, etc. Lectures.
- Course 1 is open to all students in all courses who have taken Systematic Botany.
2. Olericulture, or Vegetable Gardening; including also a full discussion of forcing and forcing structures. Lectures and other class work. Laboratory work.
3. Pomology. Lectures and other class work. Practicums once a week.
4. Handicraft. Practical training for students who intend to follow gardening as a business. An extension of either Course 2 or 3, or both.
5. Investigation incident to previous courses. For graduates and advanced students.

The last two courses are flexible and adapted to the convenience of both professor and student, and they allow one to take up advanced studies in the particular directions of proposed work. The students in these courses are few, but it is here that the skill of the teacher is best shown, and special adaptability of the student more plainly appears. Here the teaching is not didactic; teacher and student work hand in hand. Students in these advanced courses become more than mere graduates. Just now three young men are taking under the last course a special training in crossing and hybridizing, which is extended through several months.

In connection with all the courses general reading on the various subjects discussed is required and examinations are held upon books which have never appeared in the class room. Actual practice is exacted in connection with all technical courses, and excursions are taken to good orchards, nurseries and gardens in various parts of the country. Besides the above courses similar ones are afforded in arboriculture and landscape-gardening, and the practical work is aided by the use of the orchards, the vegetable-gardens, ornamental grounds, forcing houses and greenhouses connected with the University.

No college course extending over two or three years will suffice for the training and equipment of a first-rate gardener, but any young man would surely be better prepared for gardening with such a schooling than without it. With it, he would at least be less opinionated, more ready to be taught, more alert to discover improved methods of practice, and more prompt to adopt them; he would be at once more modest and more truly self-reliant.

THE movement for the establishment of a State Board of Trustees empowered to acquire and hold for public use and enjoyment historic sites, tracts of interesting scenery and open spaces of any desirable kind, which was recently started in Massachusetts by the Appalachian Mountain Club, ought to have far-reaching results. Any such exhibition of interest in the preservation of natural scenery is encouraging, as evincing capacity for pleasures which are in no degree sordid or material, and as indicating, perhaps, a slight gain in the higher elements of life and civilization. The wish to do what is thus proposed is, no doubt, a natural result of the out-of-door activities of the Club. It has been awakened in the minds of the members by personal contact with nature, and by their familiarity with interesting and beautiful scenery. It will probably be found

easier to inspire interest in the acquisition of historic sites than in the other objects of the undertaking. This part of the enterprise will come nearest taking care of itself.

The popular interest in the preservation of scenery, and the popular appreciation of the value of opportunities for change of scene and for contact with unspoiled natural beauty and calm, are but slight, but they admit of cultivation and development. An increasing and enormous density of population is certain, within a few decades, to develop conditions of life in all our older states which only thoughtful men and women now foresee. Our country is rapidly becoming a land of cities and towns. As people are, more and more, obliged to live and work in thronged and crowded communities, the need of occasional escape from the pressure of toil, and of recreation, by experience of the silent unconcern of nature, becomes more imperative. The most important among the objects of this movement is the acquisition of open spaces, places where the people of the towns can breathe, and the establishment of conditions under which they will be permanently available for public use. Their management and embellishment can be considered afterward. They will reflect the taste and civilization of the people of the state. But it is always appropriate to say that in such places we do not want statues or fine buildings or decorative artificial gardening. All these are impertinences, but trees and grass, rocks and streams,

"The wide, aerial landscape spread,"

the open air, the sky and sea—these have the power to heal and soothe and charm.

The movement should be made broad enough from the beginning to include and enlist all who appreciate out-of-door interests and objects of any kind, the preservation of natural scenery, the care of trees, forests and wooded lands, and of fish and game preserves, the purity of the water-supply for cities and towns, the treatment of roadsides, and of mountain and sea-shore commons and public parks and open spaces. The development and direction of popular interest in the objects of the undertaking will require and reward persistent effort. The work has been very happily begun, and all public-spirited citizens of the commonwealth should help to make it successful.

The North-western Lumberman, a trade journal published in Chicago, has for years been endeavoring to turn into ridicule every statement which has been made with regard to a probable failure of the pine supply of the north-west. To our enterprising contemporary the forests of the lake region were boundless and inexhaustible, and the men who ventured to suggest that even an American forest, if a hundred times as much lumber was cut from it every year as the annual increase of the trees produced, must in time come to the end of its productive powers, were set down as cranks or alarmists, or something worse. It is interesting, therefore, and exceedingly suggestive, to find in a recent issue the following statements:

The most conspicuous feature of the present season's lumber trade in the north-west is the comparative scarcity of what, in this market, is called good lumber—that is, lumber that will grade C and better. Not two years ago selects and uppers were the druggiest lumber going, stocks in this market having been large, so that dealers made sacrifices of price to get rid of such stock.

A decided change has come in respect to good lumber. Men who two years ago scouted it as a drug cannot now obtain it without special effort. Time was when dealers expected to get a fair proportion of good lumber with the inferior grades, and that without difficulty in the open market. Now they have to go on a still hunt for good stock. The fact is that good lumber is getting scarce, and dealers who want to handle it are put to their wits' end to procure it in sufficient quantity unless they choose to bull the market in competition with other buyers.

The result of this more recent development in the trade is to reduce the average quality of stocks that are thrown on the open market. There is plenty of coarse lumber, and the tendency is to a constantly overloaded market for such product.

The Carob Tree.

THE illustration on page 323 represents a specimen of the Carob-tree or Carubier of the French—the *Ceratonia Siliqua* of botanists—taken in Algeria. The Carob is a widely distributed plant of the Mediterranean Basin from Spain to the Orient, but more especially of northern Africa, where it grows in all sorts of soils and situations from the slopes of the driest limestone mountains to the most fertile oases. It is not common, however, even in Algeria or in Tunis, and grows as an isolated specimen, or in groups composed of a few individuals. The Carob is one of the most beautiful and useful trees of the countries which it inhabits. It grows to the height of forty or fifty feet, with a stout trunk, and a compact head of dark green, lustrous evergreen foliage. The flowers are not at all conspicuous or showy, resembling somewhat in size and arrangement those of our Three-thorned Acacias, to which the Carob is rather closely related botanically. The fruit is a thickly curved pod, and when it is ripe the seeds are encased in a sweet pulp, which is eaten by the people of the countries where the tree is found. The great value of the fruit of this tree, however, is to feed to horses and hogs, which fatten on them rapidly; and great quantities of Carob-pods are exported from Crete and other eastern countries to central and northern Europe, especially to Great Britain, for this purpose. The pulp has been found to contain sixty-six per cent. of pure sugar and gum, and it has been used in the manufacture of syrups, liquors, and an imitation of chocolate, and by the Egyptians in preparing a sort of sugar used by the Arabs; the pods, too, are preserved in the same manner that the pods of the Tamarind are preserved in India and other tropical countries.

There is considerable historical interest attached to the Carob; the fruit was once supposed to be the food which supported Saint John in the wilderness, the seeds being held to mean "locusts," and the pulp "wild honey," so the tree or its fruit came to be called "St. John's Bread;" and the dry valves of the pods have been considered the husks the Prodigal Son longed for in the last stages of his misery and starvation.

The wood of the Carob is hard, heavy, very durable, and of a handsome rose color. It is admirable furniture-wood, and is used locally for carts and agricultural implements. Its rarity is the only cause which prevents it from being used very generally in construction and the arts.

The Carob, as it flourishes in all sorts of soil, and is able to withstand drought and other hardships, is often planted, especially in the Orient and in Africa, for the grateful shade its heavy foliage affords, as well as for its valuable fruit. This tree was early introduced by the Spaniards into Mexico and South America, and the experiments which have been made of late years with this tree in California seem to indicate that it may be depended on in that state, where its more general cultivation on ground too stony or too sterile to produce other crops can be recommended.

Our illustration is made from an Algerian photograph, for which we are indebted to Mr. Francis Skinner, of Boston.

Signs of Intelligence in a Madeira Vine.

TWO or three years ago I began, without any great seriousness, experiments on some Madeira vines, which presently began to prove more interesting than was anticipated. Before this my attention had been attracted to peculiar movements made by this plant in the course of its spiral ascent of a stick. If allowed to grow a few inches above this support the extremity of the plant will sway backward and forward a few hours and then will enter upon a regular revolving movement, always from right to left or contrary to the direction in which the hands of a watch move. One revolution consumes about three hours.

One of my plants began to grow on April 1st, and at the end of fourteen days was twelve inches tall and showing signs of uneasiness—now bending away from a vertical position and again standing nearly upright. On the 16th it was eighteen inches high, and being too top-heavy to stand erect, it began to fall away from the pot, which stood upon a table, toward the floor. This was done gradually and apparently with conscious care. It seemed to feel at times that it was letting itself down too fast, when it would stop with a jerk, like a nodding child, half asleep. When near the floor it began describing ellipses, about three inches in diameter, with its upturned extremity. On the 19th it was twenty-six inches in length, and would describe a crescent-shaped loop, seventeen inches in length by six inches in breadth in about two hours. On the 23d it was three feet and four inches long, revolved with less regu-

larity, and at times drooped as if weary or discouraged in trying to find something upon which it might entwine itself.

Thus far no opportunity had been given the plant to climb, since it was desirable to see what it would do to meet the absence of some support. On the 26th a new route of travel was undertaken at six o'clock in the morning, and at nine o'clock the extremity, which was near the floor, at the left side of the pot, had described a circle six inches in diameter. It then slowly swept around to the right side and made another irregular circle, and then returned to the left side of the pot; these movements occupied just twelve hours. The track of the tip of the vine was carefully traced with a pencil upon a sheet of paper laid beneath it, and the entire line of travel measured no less than six feet nine inches.

During the evening the plant became quiet, and probably remained so all night. At ten A. M. the next day, however, it began pointing its tip in various directions, and at noon assumed the form of a corkscrew, about four inches long, which posture it retained until night and then straightened out.

On May 1st the vine was lifted and tied to a vertical support—a large thread—where it remained entirely quiescent for two days. Then it began growing again as if it had recovered from what had been for six days a condition near the point of death.

Another vine was observed carefully during several days of cloudy weather. It uncoiled itself from the stick and reached away toward the light at an angle with the horizon of some forty-five degrees. It was carefully recoiled about its stick, but after it had grown some three inches more it unwound itself and stood away toward the window as before. Time after time during the continuance of the cloudy weather it was brought back to its support, but invariably left it. Then followed a fortnight of bright, sunny weather during which the vine showed no disposition to escape from its stick or stop its twining growth.

Attempts were made to induce another plant to twine in the direction opposite to its normal one, but no ingenuity could deceive the plant as to its proper course. All the experiments seemed to show how much like an animal was the plant in its sensitiveness, not only to changes of light and temperature, but to harsh treatment. Whenever restrained or forced, no matter how tenderly, out of its natural method of growth, all progress was retarded and the health of the vines disturbed in a marked degree. Plants seem to be creatures of feeling and the similarity of movement and of apparent purpose between them and the lower orders of animals are used to strengthen their theory by those who hold to the doctrine of the identity of life in the two kingdoms.

Erie, Pa.

T. D. Ingersoll.

The Blue Gum Tree.

THE Australian Blue Gum, *Eucalyptus globulus*, has become one of the most prominent and characteristic features in southern California forestry. A tall, slender tree, attaining to an immense height, this native of Van Dieman's Land and Australia has taken firm root upon the Pacific coast.

Many a hillside and plain—a few years ago treeless, parched and brown—has been transformed into a mass of living green, furnishing the refreshment of shade and filling the air with a health-giving, grateful fragrance, through the slight encouragement given to this tree by man. From Eureka to Eusenada—a distance of nearly a thousand miles—this tree has steadily gained in favor. In its native land it grows to a height of three hundred and fifty feet, with a diameter of fifteen feet and more. Already many of the older trees on the coast range are from one hundred to one hundred and fifty feet in height.

A forest of Eucalyptus is something magnificent. Stately in proportions, the trees tower tall and straight above any of our indigenous species in the south, growing so close together as to form an almost impenetrable shade. Altogether it is a spectacle to gladden one's eyes in this "dry and thirsty land." Millions are already planted, and hundreds of thousands are annually planted because of the valuable qualities of the Eucalyptus as a forest-tree. Quick in its growth, it is an unfailing source of supply of fuel and valuable timber in a land where wood and lumber are scarce.

In San Diego County these trees are extensively grown for fuel, but thousands of them are also annually planted for their beauty, as shade or ornamental trees in parks and along avenues, while other thousands are planted as wind-breaks to young orchards, for which use they are well adapted.

The Eucalyptus is easily propagated from the seed, a pound of which may be obtained for five dollars. From this quantity of good seed over three thousand trees can be raised. The first seedlings sold in California, imported from Australia,

sold at auction for five dollars apiece. To-day they are worth a cent a plant.

The Eucalyptus thrives on the poorest soil, and once established firmly requires no further care or attention. It seems to do best on the sandy bottoms, but may also be made to do well on the higher mesa lands if once it is able to establish itself, when it will send its roots down a long way where it can get an unfailing water supply. That its culture on cheap lands is exceedingly profitable needs no further demonstration in California. A Eucalyptus-forest may be cut down once in every five (some say three) years to advantage, when new shoots will start from the stumps and a new forest arises from the ruins of the old, and without the first expense of either plowing, cultivating or irrigating, since the roots are already established, vigorous, healthy and uninjured by the fall of the parent trunk.

In the presence of the invigorating fragrance exhaled by this tree, fevers and malaria largely lose their terrors. In California, a dry, pure atmosphere like ours, the valuable quality of this tree, its anti-febrile properties, has naturally been largely lost sight of, as compared with other more important interests. The tree absorbs water with surprising facility, and it is this that is considered by many the basis of its prophylactic properties.

The Blue Gum or Fever-tree was introduced into Paris by the French government in 1860, and was subsequently planted in Africa, Spain, Italy and portions of France, where many large forests have been produced. In 1875 the City Council of Houston, Texas, decided to give the tree a trial in view of the yellow fever epidemics that had periodically filled the city with mourning. During 1875-76 the city was freer than usual from the disease, and in 1877-78, according to the Health Officers' report, was one of the healthiest cities in the Union. As to the subsequent experience of that city I have no data at hand.

The Eucalyptus shows remarkable celerity of growth, having attained a height of sixty feet in eleven years, and in India its growth has been yet more rapid. In Mexico it has succeeded remarkably well at elevations of from 2,500 to 7,000 feet. It has withstood a temperature of nineteen degrees F., but generally succumbs at seventeen degrees F. Frost will kill the young trees.

The timber is used for a great variety of purposes, in ship-building, and in all kinds of out-door work. It is about equal in quality to the best English Oak and to the American Ash, and if Californians will have the patience to grow the tree for timber rather than for fuel—as they now do almost exclusively—they might expect yet handsomer returns from its culture than now.

The tree is remarkably free of any disease and of insect pests; moths, mosquitoes, fleas and other insects are said to forsake a room where the leaf branches of the Eucalyptus are freely scattered about.

Notwithstanding there are over one hundred and fifty species of the Eucalyptus, *E. globulus* alone has met with widely extended popular favor in California. Several others like the Red Gum and the Iron-bark seem to thrive equally well with us and are gaining ground.

Thanks to this friendly genus it is only a question of a century or less before the now desert-like plains of southern California can be covered with a growth of gigantic trees.

San Diego, Cal.

C. R. Orcutt.

Nematodes and the Oat Crop.

THE Oat crop at the time of writing throughout New Jersey gives all the signs of failure. Many farmers have already plowed the fields again for some other crop, while many more are anxious to know what to do. In general appearance the Oat-plant is dwarfed, and nearly all the leaves, especially the lower ones, are brown and dead. As the wheat, rye and grass crops have been badly attacked this spring by the aphid or grain louse, many farmers have ascribed the wretched appearance of the oats to the same enemy, but I am assured by Professor Smith that the aphid cannot be held responsible for a great part of the destruction that is so widespread among the Oats of the state. Therefore it seemed advisable to make a microscopic examination of the diseased plants in order to discover whether the cause of this disaster was not some parasitic fungus. Specimens in root, stem and leaf, from several localities, have been examined, and nothing in the nature of a rust, smut, mildew, mould or blight was found. It may be true that a low form of organism belonging to the group of bacteria is the cause of the unhealthy growth.

Bacteria were found present, but no attempts were made to determine the bacterial origin of the disease.

But small bodies were found within the substance of the smaller roots and these at once suggested undeveloped worms of minute size called nematodes. As the search continued the mature worms were found in full activity.

Readers of GARDEN AND FOREST will remember an article on the Clematis disease, by Professor Comstock, which appeared in the number for January 29th of this year. In this article Professor Comstock showed that these minute worms, which are akin to the well known "vinegar eel," a minute creature often seen wriggling near the surface of vinegar, were the cause of this wide-spread disease of the Clematis. In a note of mine on Professor Comstock's paper, which appeared in the number for February 5th, it was stated that a part at least of the Violet-disease was due to a similar cause, and I mentioned the fact that Dr. Neal, of the Florida Experiment Station, and Professor Atkinson, of the Alabama Station, had each issued large illustrated bulletins which show the ravages of these thread-worms in the Peach and Orange-groves of the south. A species of these nematodes is said to cause the so-called tulip-root in Oats in England.

These worms are very destructive to some of our principal garden crops, and it is evident that a large field is opening in this country for the labors of the economic helminthologist. Unfortunately no cheap method has been discovered which can entirely defeat the attacks of the nematodes. One plan is to cultivate upon an infested area only such crops as are not attacked by these worms, so that they can be starved out, or if the rotation of crops is practiced unsusceptible plants may be used in some part of the rotation. As some weeds, the Pig-weed for example, furnish particularly favorable shelter for these microscopic enemies, they should be kept scrupulously subdued by clean culture.

Nematodes may be introduced into a field in composts and barnyard manure, and therefore it is wise, in case of a threatened invasion, to use unslaked lime in thin layers when constructing the compost or manure pile.

It will be noted that the two bulletins spoken of are from the far south. With us in the latitude of New York there is much less occasion for alarm in an ordinary season, for the cold of an average winter is too severe for these worms to withstand. The large numbers of nematodes that have been found upon various crops, such as Spinach and Violets, during the past winter, is probably due to weather unusually favorable to them. A winter warm enough to give us Peach-blossoms during almost every week from December to March was well suited to their rapid multiplication.

Corn is the only member of the Grass family mentioned in the printed lists of hosts for nematodes. The Oat, therefore, is an additional species in that family that is subject to these attacks.

Rutgers College.

Byron D. Halsted.

New or Little Known Plants.

Trillium sessile, var. Californicum.

THE genus *Trillium* contains several attractive garden-plants. *Trillium grandiflorum*, the large, white-flowered species of the eastern and northern states, is the most beautiful of them, and when once established in a suitable position it is not excelled in beauty by any spring-flowering herb. The Painted Trillium, as *Trillium erythrocarpum* is called on account of the bright purple-rose colored markings which appear on the lower part of the petals, is hardly less beautiful, although the flowers are considerably smaller and much more modest than those of the better known species which we have referred to above.

Another plant of this genus, of first-rate value as a garden-plant, has been brought into cultivation in recent years. It is the Pacific coast form of a widely distributed eastern species, *Trillium sessile*, found from Pennsylvania and Wisconsin to Florida and Alabama. The western form of this plant, known as variety *Californicum*, is widely distributed through the northern part of California west of the Sierra Nevada and extends into Oregon. The habit of the plant and the character of the flower is represented in our figure on page 321, which is made from a specimen grown in the garden of Gillett & Horsford, of Southwick, Massachusetts, who have obligingly sent it to us for the purpose.

Trillium sessile, var. *Californicum*, is a stout plant

with broadly rhombic-ovate leaves varying from three to six inches in length, lanceolate, acute, erect sepals, and oblong or rhombic-obovate petals, which vary in length from one to four inches. These differ in color on different plants from purple to pure white and at first are nearly upright, becoming reflexed above the middle when the flower is fully expanded. The form with pure white petals is the handsomest and most desirable as a garden-plant.

The Pacific coast *Trillium*, like the other species of the genus, is most satisfactory when it is planted in deep, moist soil in the shade of deciduous trees; that is, where it can enjoy early in the season or during the blooming period full exposure to the light, and where later it can be protected by the leaves of the overhanging trees from the full blaze of the sun. *Trilliums* should be planted early in the autumn or not later than the first of October if good flowers are expected from them the following spring. They do not show, however, what they are really capable of until they have been allowed to grow undisturbed in the same spot during three or four years and have become well established. Then, if the soil in which they are planted suits them and the situation is a favorable one, they form broad masses of immense leaves and produce flowers of large size and surprising beauty.

Foreign Correspondence.

London Letter.—Pæonies.

AMONG the many beautiful border plants that have sprung into popularity in England in recent years, the Pæonies take foremost rank. Like the Daffodils, they were favorite garden plants in England over three hundred years ago. Gerard said of them in 1580, "All sorts of Pæonies do grow in our London gardens." The revival of a love for these and many other old-fashioned hardy plants may be traced to the development of out-door gardening and especially of the mixed border. Pæonies are essentially border-plants. They are hardy, easy to cultivate, almost any soil agreeing with them; they live to a good age and they flower freely. Their flowers are enormous, often elegant and fragrant, whilst their colors vary from deep purple-crimson to almost white. What could one desire more in a hardy border-plant? In England, Belgium and France nurserymen have done much during the last twenty years to improve the flowers in form and color and also to increase the number of good varieties. A collection of Pæonies is now a feature in all good gardens in June, whereas a few years ago they found admirers chiefly among the cottager. One of the principal raisers and growers of these plants in England, Mr. Kelway, of Langport, admits that he was first impressed with the beauties and capabilities of Pæonies on seeing them worn by the men and women assembled at an Irish wake some thirty years ago. Some of the best of the sorts he has bred from, he obtained from an old woman in his parish. The long lost *P. Whitmanniana*, a yellow flowered species, was rediscovered about eight years ago in an obscure Irish garden. Messrs. Barr & Son, George Paul, Ware and Kelway now possess an immense stock of Pæonies, an indication of their popularity in England. With a view to focusing the Pæony-knowledge and material, the Royal Horticultural Society has this week held a special exhibition of the plants, and papers on their culture, history and classification were read by Mr. George Paul and Mr. Lynch, of the Cambridge Botanic Gardens. The exhibits were marvelous in point of size, color and fragrance in the flowers, Messrs. Kelway staging a splendid array of blooms. Some of the new sorts received certificates. Whilst such beautiful double-flowered kinds as Princess Mary, Sainfoin, James Kelway and Lady L. Brumwell were greatly admired, the single flowered varieties received much attention. Some of them were remarkable for great substance of petal, far in advance of the older kinds, in which flimsiness of flower was a drawback. A deep blood-crimson kind named Stanley, a pink and white called Dorothy Tennant, and Julia Kelway, a blush white, were amongst the most notable of the single flowered sorts.

Tree Pæonies were not well represented, most of them being past flower here. The behavior of the Tree or Moutan Pæony in English gardens is not always satisfactory. In some situations the plants die a foot for every six inches they grow; in others they grow well for a time, and then go off suddenly, apparently attacked by some fungoid disease; whilst in some

gardens one may see immense bushes of them, eight feet in diameter, and bearing hundreds of huge blooms, each as large as a moderate-sized cabbage. Where they thrive these Tree Pæonies have few equals among early summer flowering hardy shrubs.

The Belgian and French nurserymen are the chief growers and raisers of Moutan Pæonies; Messrs. Makoy & Co., of Liege, and M. Dessart, Chenomceaux, Indre et Loire, having

suspected that the cause lay in this very fact. That there is not any close affinity between the tree and the herbaceous species is evident from their refusing to cross with each other, whilst there ought to be good physiological reasons against grafting a decidedly woody shrub on the roots of a plant of very succulent and herbaceous character. The right method, one would think, would be to use seedlings of *P. Moutan* as stocks. Herr Max Leichtlin, who has raised one



Fig. 44.—*Trillium sessile*, var. *Californicum*.—See page 320.

exceptionally rich collections. The species was introduced from China to Kew by Sir Joseph Banks in 1787. Many varieties have since been obtained from the same source. The great range of variation in size, form and color, and even in leaf characters, is remarkable in this species.

I believe it is the almost universal custom to graft *P. Moutan* on the roots of the herbaceous kinds, and in trying to account for the bad behavior of the Tree Pæony at Kew I have half

of the finest seedlings in Ceres, states that the seeds take about fifteen months to germinate, and the plants are from five to seven years old before they flower. Amongst the varieties grown at Kew the richest in color is that called *Gloria Belgarum*. The flowers are full double, a foot in diameter, and rich rosy red. These plants require a deep, rich, loamy, rather moist, soil, and a position shaded from very bright sunshine. In England they rush into growth so early

in the spring that a little protection must be given in frosty weather. When at rest frost does not injure them; indeed Fortune, who introduced many varieties into England, declared that a severe winter was conducive to their health.

The history of the herbaceous species, as represented in English gardens, was treated at some length by Mr. Paul. Almost all of the several hundred named kinds catalogued to-day are the progeny of *P. albiflora* and *P. officinalis*, a few only being from *P. peregrina*, and two or three from *P. tenuifolia*. Mr. Baker, in his monograph of the genus published in the *Gardeners' Chronicle* in 1884, admits only twenty-two species. They are distributed over Europe, temperate Asia, China and America. In the last-named country, *P. Brownii* is the only species that occurs wild. It extends from California to the Rocky Mountains. In 1884, and, so far as I know, even now, this species was not in cultivation in England. A hundred years ago *P. officinalis* and *P. grandiflora* were the only species recorded as being in cultivation in England. Mr. Paul says that the attention of the florist was not devoted to the herbaceous Pæony until about 1840, when Parker, Salter and Loddiges began to collect and cross them. In 1855 there were twenty-four double-flowered varieties, nine of which still survive in English collections. Lemoine commenced as early as 1824, whilst in 1840 the Prince Salm Dyck had a good collection of sorts in his then famous garden near Paris.

The cultivation of the herbaceous species was, Mr. Paul said, ridiculously easy. The richer the soil the better, of course, will be the results, for Pæonies are gross feeders. Mr. Wilkes, the Secretary of the Society, who showed a fine collection of flowers, stated that he emptied the cess-pools of his pig-sties upon his Pæony-clumps. They like plenty of moisture at all times. In shade, as well as in the open, they grow quite freely. Some of the growers of flowers for the London markets plant Pæonies under their orchard trees exactly as they do Gooseberries and Rhubarb; in this way they get a plentiful crop of flowers, which sell for about half a dollar a dozen. The most favorable time for transplanting is from November to February. Mr. Paul advised starting with small crowns in preference to large clumps, which rarely transplant satisfactorily. The third year after planting ought to see abundance of flower. The seeds take about a year to germinate, and the plants flower when four years old.

London.

W. Watson.

Cultural Department.

Notes on Shrubs.

THE earliest species of Lilac in cultivation to bloom is *Syringa oblata*, while one of the latest is the large tree-like *S. Japonica*. The interval between these two extremes is from five to six weeks. As a sequence of flowering Lilacs is sometimes a desideratum the following data may give an approximate idea of the times of blossoming of the different species when growing under the same conditions. *Syringa oblata*, of which a figure from a photograph appeared in the first volume of GARDEN AND FOREST (p. 221), blossoms in this climate about the middle of May, varying with the rest of vegetation in being a little earlier or later according to season, situation and exposure. The bright lilac flowers of this species do not differ greatly from some of the forms of the common Lilac, and are no better, although the flowers of *S. oblata* have a peculiar character hard to describe, but which enables any one familiar with both to separate them easily. The thick, leathery, rounded, heart-shaped leaves are also so distinct as not to be easily mistaken. It has been claimed that these are not attacked by the mildew which often seriously injures some other kinds, but, in some localities at least, the foliage of this species is by no means exempt from the disease.

A week or more after *S. oblata* begins to blossom the first flowers appear on the earliest garden varieties of the common Lilac (*S. vulgaris*). One of the most precocious of these is the old double flowered, small paniced variety known in catalogues under the name of *Syringa vulgaris, flore pleno*. It is closely followed, however, by the numerous other forms originating from the same stock, or by the hybrids with other species, which are likely to be greatly multiplied and give rise to forms as early as *S. oblata*. Out of the hundreds of the so-called varieties of *S. vulgaris* now offered for sale, a selection of a dozen might be made which would practically include all of much value. A large number are being tested side by side at the Arboretum with a view to comparing the distinctive merits of their blossoms. For the amateur who has only space in his garden for one or two plants of this type there are few which can give more satisfaction than the old Charles the

Tenth as a dark red, and Marie Lagrange as a large flowered and large paniced pure white one. Both of these seem slightly later in flowering than the average of the forms and it is noticeable that the flowers maintain a fresh looking appearance for the longest time.

When the forms of *S. vulgaris* are grafted upon stock of the common Privet (*Ligustrum vulgare*) they make much more dwarf and compact plants and bloom sooner than when grafted on stock of their own species. The two Lilacs known as *Syringa Persica* and *S. Chinensis* blossom at the same time as *S. vulgaris*, and the flowers last as long as those of the best forms of the most common species. These plants are becoming even more common in some old gardens than *S. vulgaris*; and, on account of smaller size and more slender, graceful habit and the particularly large, thick clusters of flowers which they bear, they are too valuable to be omitted from the amateur's garden. There are forms of both with flowers varying in color from dark purplish red to white.

Syringa pubescens as it grows at the Arboretum has rather small panicles of pretty, pale lilac flowers, which appear with those of the preceding species. It is of rather straggling habit and does not present any marked peculiarities which would make it of special value to the horticulturist or florist. It is not until the last flowers of all these species and varieties have disappeared or are fading that the blossoms begin to expand upon the Asiatic *S. villosa*, and upon *S. Josikaea*, which is supposed by some botanists to be a variety of it. The inflorescence, however, is so strikingly different that it seems quite probable that they may yet be proved to be distinct species.

The first flowers of *S. villosa* generally appear at the end of the first week of June. The buds and outside of the corollas are of a rose or lilac color, but when expanded the open flower is very pale lilac or almost white. They are produced in broad, heavy clusters on rigidly upright branches, the whole plant having a coarse and stiff aspect. A figure of a flowering branch has been given in GARDEN AND FOREST, vol. i., p. 521. The flowers possess a good deal of odor, but it is less agreeable, though less intense, than that of the common Lilac.

Syringa Josikaea is not known in a wild state, and has all been propagated from a single plant found in a Hungarian garden. The slender, tubular, dark purplish flowers are produced in much smaller panicles than those of *S. villosa*; and as the plant does not appear to bloom so profusely as most of its congeners it is of less value for ornament. But on account of its lateness and the peculiar color of its blossoms it is not likely to be neglected or left out of any collection. These two species continue to maintain some fresh looking flowers for about a fortnight, and it is not until the last of them are fading that the blossoms appear on those species belonging to that section of the genus which have white flowers and very short tubular corollas. The two or three kinds in cultivation are all of quite recent introduction, and are as yet very little known outside of botanical gardens. The finest and most desirable of these is *S. Japonica*, which was described by Professor Sargent and figured from photographs in GARDEN AND FOREST, vol. ii., pages 293 and 295. The plants raised from seed appear variable in their time of flowering, a difference of a week being noticeable in specimens growing under very similar conditions in different gardens. Last season was an unusually early one, and the plant which was figured in GARDEN AND FOREST was in full flower about June 15th, but this year it did not reach the same stage of development until about June 24th. This plant is one of the earliest; others at this date (June 24th) hardly have the first flowers open. The small white flowers have a slightly creamy tinge of color, and in odor as well as general appearance they are more like gigantic panicles of the flowers of the common Privet than those of a Lilac. If it should be found possible to hybridize this splendid tree-like species with any of the Lilacs of our gardens some remarkable productions may be expected. The best plant at the Arboretum is now twenty feet high, with a clean trunk sixteen inches in circumference at four feet from the ground.

Syringa Amurensis has much of the appearance of *S. Japonica*, but so far seems to be inferior to it. A plant sold under the name of *S. Sibirica* seems to be the same as this. *S. Pekinensis* is flowering freely at the Arboretum this season. The flowers are smaller and a little purer white than those of *S. Japonica*, and the panicles are not quite so large. The whole aspect of the plant is strikingly different on account of its smaller leaves and much more straggling or spreading habit. The largest plant has now exceeded the stature noted by Abbé David when collecting about Pekin, who described this species as a shrub three metres (about ten feet) in height, and the white flowers exhaling an odor of honey.

Arnold Arboretum.

J. G. F.



The Carob-tree (*Ceratonia Siliqua*).—See page 318.

Notes on American Plants.

THE *Malvaceæ* or Mallow Family constitute an interesting class of plants, represented in North America by nearly one hundred and fifty species and varieties composed of herbs and shrubs. Many of these are already in cultivation, but there are still others that are destined to hold good positions among our garden flora. One of these, which we believe is not yet generally known, at least to American growers, is the Maple Leaved *Sphæralcea*—*Sphæralcea acerifolia*. It is found in the basin of the Columbia River and its tributaries, also in portions of Nevada and Utah, at from 6,000 to 8,000 feet in altitude. Its usual height is about four feet, yet in favorable situations it is sometimes six feet high. It is a herbaceous per-

ennial. The numerous stout stems terminate in clustered racemes, almost a foot in length, of pale purple flowers which are from half an inch to an inch and a half wide, and very pretty. Below these racemes are numerous large, cordate, five or more lobed leaves, shaped like those of the Maple, from which the plant takes its name. Its time of flowering is from June until September. It is hardy, easy of culture and should be grown in the sun.

Baptisia leucantha, one of the False Indigos and a member of the Pulse Family, grows from two to three feet high, bearing an erect, long, loose raceme of white flowers. It is a taller plant with less divergent branches than *B. leucophæa* mentioned in a previous paper. The foliage is not abundant. It is found in alluvial soil from Ohio to Wisconsin and southward. It needs a light soil and full sunshine.

Calochortus longibarbus, from Oregon and Washington, is a desirable species for this climate, as the plants show more health and vigor than most of this class here. It grows about a foot high, bearing from one to three, usually two, pale purple flowers an inch and a half wide. Across the base of each petal is a dark purple stripe which gives the flower additional beauty. Above this, on the inside, the petals have numerous long, white, hair-like beards almost an inch long. The leaf, which is usually single, is about eight inches long by half an inch wide. Our plants were protected during winter. It should be set in a light soil and exposed to sunlight in September or October.

Allium hamatochiton, from southern California, is a small species six or eight inches high, bearing an umbel of six to twelve small white flowers with greenish stripes and a reddish brown centre. It is a tender plant and should be wintered in sand in the cellar.

Tigridia buccifera, which was first figured and described in GARDEN AND FOREST (vol. ii., p. 412, Fig. 123), is quite abundant in portions of southern Texas. This we believe is the only species yet reported within our borders. It is one of the earliest if not the very first to flower. In a light, loamy soil it is not so large as in a clay loam, yet it seems to do fairly well in any ordinary situation and is much larger after being cultivated than when first taken from its natural home. Although its individual flowers are of very short life, they are borne in such long succession that a bed of them will be almost continually in bloom from the middle of June until early autumn.

One of the most common of the *Rubiaceæ* or Madder Family is the little Partridge Berry (*Mitchella repens*). This charming little evergreen at this season is covered with its pairs of small fragrant white flowers, a third of an inch wide. Later in autumn the pretty scarlet berries add much to its beauty, as they offer a pleasing contrast with the thick, dark green foliage. These remain on all winter, and both leaves and fruit are as attractive in spring as at any season. The foliage is often variegated with lighter lines. It does well in a fine loamy soil, where it soon forms dense mats of its prostrate, creeping stems.

Lilium Parryi, from southern California and Arizona, is a good native species, not difficult to grow in a moist, loamy soil, and bears one to several large, handsome yellow flowers, in shape not very unlike our common Meadow Lily. The flower is fragrant, durable and quite distinct in color from other yellow-flowered varieties. It is a healthy growing plant, hardy, if planted deep, and is sure to be a favorite when better known.

Southwick, Mass.

F. H. Horsford.

An Indispensable Greenhouse.

WHO loves a garden loves a greenhouse, too, but few love a greenhouse when they can enjoy the pleasures of a garden, with all its varying scenes from spring until winter, and then a greenhouse is a luxury to some, and to others a necessity. Of course greenhouses differ greatly among themselves. To persons of limited means the greenhouse is often a combination of a stove-house, Rose-house, Palm-house, Orchid-house, and a place for keeping bedding plants for summer flower-beds. Besides these there are succulents, subtropical plants, aquatics, which must be taken up and housed just as the Queen of Autumn holds levee, and space must be afforded for a few of the choice *Chrysanthemums* which cannot endure freezing temperature. Then *Primulas*, *Cinerarias*, *Calceolarias*, *Cyclamen* and a host of winter-flowering plants must be crowded in because flowers are looked for from a gardener "who has glass." I pity a man who has such a charge. It is impossible to keep or grow tropical plants in a cool house or to grow alpine plants in a stove-house. To be successful with most plants that are now to be found grown in glass structures there must be at least three houses of different temperatures, called in gardeners' language the stove-house, greenhouse and cool or cold house. The minimum temperature of the stove-house is sixty degrees; the greenhouse, fifty degrees; the cool house, forty degrees.

The cool house I consider a necessary adjunct to the greenhouse, and if only one can be built this is the indispensable structure. The style of the house is not the most important matter. A span roof undoubtedly will give the most light, which is an important point in the construction of a greenhouse, but the roof and sides are exposed to the full action of the weather. And this will tell in winter upon the coal bill. All things considered, I prefer a span roof house; the next best house would be a three-quarter span, such as those built principally for Rose-growing. This is a very useful and economical house. Its aspect should be due south if circum-

stances permit, making it a very light house in winter; and it should be protected on the north side by a wall. A lean-to is better than none at all, and can be attached to another building if suitably located; but such a house is not best adapted for plant growing. A very convenient house is a span-roof eleven feet wide, fifty feet long, four feet sides and seven feet six inches high in the centre. This will allow a three-foot six-inch bench or table on each side and a walk two feet six inches through the centre. Such a house requires only ventilators on either side of the ridge. Two-foot sash is preferable the whole length on each side, and a flow and return pipe three and a half inches in diameter will answer for heating. In such a house *Carnations* and *Mignonette* will flower all winter; *Stocks* and *Wallflowers* will furnish early bloom; *Cinerarias* and *Calceolarias* are quite at home; *Verbenas*, *Petunias* and many bedding plants can be safely housed; *Echeverias* and other succulents and dry roots will keep well under the benches, and it is just the place for *Chrysanthemums* from the time they leave the cutting bench until they are planted out.

Staten Island, N. Y.

W. Tricker.

Orchid Notes.

Phajus Humblotii.—When this beautiful species was first introduced and described by the collector as a rose-colored *Phajus* it caused a sensation among Orchid-growers. It is named in honor of its discoverer, M. Leon Humblot, who brought the plants to Europe some nine years ago. Very few arrived alive, and consequently large prices were realized for them. Several years elapsed before any attempts were made to reintroduce it, and the plant became almost extinct. Some twelve months ago an importation was received by F. Sander & Co., St. Albans, and it is now so widely distributed that few collections of Orchids are seen without it. It fortunately proves an easy plant to grow, it flowers abundantly and occupies little space. In habit it is both dwarf and compact, having robust rich green foliage, and produces a spike one and a half to two feet high, on which are borne twelve to eighteen bold and attractive blossoms, arranged in such a manner that each may be seen to advantage. They measure individually two and a half inches across; the sepals and petals are broad and suffused with a rich rose color; the lip is broad, the upper portion furnished on either side with reddish crimson; the crest is very prominent and of a fine bright yellow. While growth is being made, which is during the summer months, this plant requires a temperature of sixty-five to seventy degrees, with a position near the glass, but precautions should be taken that it does not receive direct sunlight. Ventilation is also highly beneficial, and when growth is fully completed water should be sparingly given, or growth will again commence before the flower-spike develops, which is immediately after the growth is made. This *Phajus* enjoys a compost of turfy loam, coarse sand and fine peat, with a portion of chopped sphagnum. There is a well-grown plant of this species in the collection of Mr. F. L. Ames, North Easton, Massachusetts, and when in bloom a short time since it was a strikingly beautiful object.

Phajus Henryii.—This is also a valuable acquisition, introduced by M. L. Humblot together with the plant above described. Few plants, however, were received, and they were afterward rarely seen in a thriving condition. A considerable number of plants were sent to Europe last year, together with the other *Phajus*, and they arrived in excellent condition, and the plant is now often seen growing luxuriantly. The blossoms of *P. Henryii* are paler in color than those of *P. Humblotii*, the lip especially being much lighter, the upper portion marked with brownish crimson and finely fringed. A plant is now in bloom in Mr. H. Arnold's collection at Eighty-fourth Street. The spike is erect and two feet in length, and carries seventeen blossoms, which greatly resemble those of *P. Humblotii* in shape. It is a charming species, and is admired by all who have seen it.

Summit, N. J.

A. Dimmock.

Papaver bracteatum roseum or Blush Queen is a variety which is said to have originated in an English private garden and has lately been distributed. It resembles the type in foliage and habit, but the flowers are quite unique, being pale blush pink, shading to deep red satin blotches at base of petal. In color effect it is something like the flowers of the Rose of Sharon (*Hibiscus Syriacus*), though brighter. It is a charming flower, though quite inconspicuous in comparison with the scarlet perennial Poppies, which are among the most vivid of flowers, though among a lot of seedlings there will usually be found some variation from bright orange-scarlet to blood red. The new variety seems to be the first decided break from

intense reds and leads one to hope for a pure white form—which would be a grand plant.

Scabiosa Caucasica is one of the choicest of hardy plants, and indispensable in any garden. The plants are dwarf, and the flowers, thrown well above the foliage on long stems, of a light lavender color and some three inches in diameter, are as pleasing as useful for cutting. Stock of this plant may be readily had from seed. The plants require a deeply worked soil, and if necessary to shift, it should be done with great care, as the roots extend deeply even in a young state. It seems reliably hardy in all stations in this latitude.

Silene inflata, the Bladder Campion of Britain, seems to have become naturalized in some of the eastern states, which is scarcely a matter of wonder, as some bits sent me have proved very prolific and vigorous and well able to hold their own among ordinary plants. This is an attractive plant with white flowers, globular capsules and graceful habit.

Elizabeth, N. J.

G.

A beautiful Rose in Mr. Waterer's nursery at Knaphill is the result of a cross between *Rosa rugosa* and a Hybrid Perpetual variety. It is not an exhibition flower, nor perhaps one that show-flower fanciers would care for; but the blooms are of an intense crimson color and as sweetly scented as the old Cabbage Rose, while the plant is free both in growth and bloom. This is the kind of Rose that many would admire, although it may show a little of its yellow centre, not only for its color, but sweet scent. A scentless Rose is without its greatest charm.

The Garden.

Color in the Borders.—Natural and easy combinations of color in the herbaceous borders are rare. They should not be difficult to obtain, although more forethought and time are required to produce them than in regular bedding arrangements. As the use of hardy plants for supplementing this expensive and unnatural style of gardening is in its infancy, we may, and shall, expect much improvement in the direction of proper arrangement of color. To show where experience leads, I can give a case where German Irises were planted indiscriminately among Ghent Azaleas. It was found advisable to remove all bronze and yellow-flowered varieties, as they marred rather than increased the effect intended by planting them. Another accidental case struck me as being to the point. A white and a pink variety of *Phlox decussata* had been planted near together, so that about a dozen stems of *Campanula glomerata* (blue-purple) from a neighboring clump fell closely amongst them; these together made a pleasing combination. For experiment I tried placing a few heads of *Lychnis Chalcidonica* (scarlet) with a view to effect, and also *Coreopsis lanceolata* (yellow). The combination, I thought, did not need either, and looked worse when both were added than with one only. Tall Delphiniums (blue) and *Thermopsis Caroliniana* (yellow) go very well together.

Wellesley, Mass.

T. D. H.

Correspondence.

The Study of Botany.

To the Editor of GARDEN AND FOREST:

Sir.—The recent articles in your journal with regard to the development of the powers of observation and the consequent increase of pleasure which spring from even a rudimentary knowledge of botany, have made me notice with especial interest certain passages in that delightful book of Richard Jefferies' called "The Open Air." Jefferies was one of the closest observers of Nature who has ever lived and written, yet throughout his life he prided himself on being a *dilettante*. I do not know that he would have used this word, but it is the one that fits the case. Nevertheless he was born to be something better. His dislike for the scientific student seems to have been as great, theoretically, as his scorn for the artist. Yet on every page he proves himself an artist born—one who noticed every faintest shade of color, effect of light and subtlety of form, and described them in words the full significance of which only an artist or a keen student of art can fully appreciate. And, on the other hand, he shows very often a yearning for that exact information which only scientific study could have supplied. In consequence of his neglect of both art and science, he was always a discontented lover of Nature. Finding no outlet for his passion, no purpose in his observing, he was continually questioning why beauty existed, what it implied, and how it was as beneficial as he felt it must be. In the essay called "Wild Flowers" we find singularly contradictory passages. For instance, he says, "The first conscious thought about wild flowers was to find out their names—the first conscious pleasure—and then I began to see many that I

had not previously noticed. Once you wish to identify them there is nothing escapes, down to the little white Chickweed of the path and the moss of the wall. . . . Plants everywhere, hiding behind every tree, under the leaves, in the shady places, beside the dry furrows of the field; they are only just behind something, hidden openly. The instant you look for them they multiply a hundredfold." Does not this suggest a mood which would have turned instinctively to botanical study and to books for easily won information? But no; Jefferies confesses how hard it is to discover common names from common people; he carries books with colored pictures around with him and mourns over their insufficiency and inaccuracy; he would like a botanist at hand to tell him what this thing is and that; but further than this in the path of inquiry he will not go. "If," he says, "some one tells you a plant, you know it at once and never forget it, but to learn it from a book is another matter; it does not at once take root in the mind, it has to be seen several times before you are satisfied—you waver in your convictions." Could anything be more singular as expressing the feelings of a cultivated man? It is as though he thought books were something apart from men—were not to be trusted, while the speaking voice might be. And does it not show that, after all, his interest in Nature was chiefly artistic—was concerned with beauty simply, not at all with facts? Otherwise he would have been impressed by that tracing of relationships between one plant and another which the printed page makes clear as spoken words very seldom can, and would have found his interest immeasurably increased by the ramifying facts thus made plain. It is, indeed, a curious study in psychology that Jefferies' book presents. A careless reader may be deluded by it into thinking that, since Jefferies could enjoy so well and describe so exquisitely, ignorance must be a blessing. But a more careful eye will trace on every page the record of a mutilation of pleasure, a limiting of intelligence, a missing of golden opportunities for which his ignorance of elementary scientific knowledge was alone responsible. He has given us a delightful series of books about Nature; had he studied a little botany they would have been twice as delightful to us, and he would have got thrice the delight he did from their making. He was always in some puzzle that he could not read, and the naive confession of the fact makes his essays often truly pathetic. Others, however, may profit by his example. The best of his words for them to remember are: "Once you wish to identify them there is nothing escapes;" and to these I venture to add on my own account, They can be perfectly identified only by a study of botany, and there is no study so easy (as far as the mere nature-lover needs to pursue it) or so pleasurable in itself. For few indeed must be the people in this time and land who share Jefferies' prejudice against books or his greater confidence in the spoken word of some chance companion.

New York City.

George Cumming.

Anthraxnose on the Maple.

To the Editor of GARDEN AND FOREST:

Sir.—Since the appearance of the note on the Anthracnose on the Oaks upon page 295 of GARDEN AND FOREST, many affected Oak-leaves have been sent to me from various parts of the country. Those from Salem County, Massachusetts, were unusually bad, and Mr. John Robinson, a keen student of dendrology, informs me that Buttonwoods never look well there, the leaves drying up in spring as if killed by frost. The purpose of this note, however, is to say that the same blight of the Sycamore and the Oak, *Gliosporium nervisequum*, attacks the Maple. A large White Oak tree about a mile from New Brunswick is badly infested with this leaf blight. Standing close to this tree is a Swamp or Red Maple (*Acer rubrum*), many of the leaves of which were brown and wrinkled in patches. These portions are found to be attacked by the same blight and present the peculiar characteristic of forming the spore patches along the leaf nerves as indicated in the specific name of the fungus. The leaves of the Maple upon branches interlocking with those of the deceased Oak were noticeably the most distorted. This makes three distinct groups of forest-trees susceptible to attack from the same Anthracnose.

Rutgers College.

Byron D. Halsted.

The Blight of the Sycamore.

To the Editor of GARDEN AND FOREST:

Sir.—In your issue of last week you ask for notes of the Sycamore disease, *Gliosporium nervisequum*. It has been known here for the past twenty years, and those who have been here that long say, "worse this year than ever." It is common at Bloomington, in the central part of the state; at

Rockford in the northern part; and at Hamilton on the Mississippi, across from the north-east corner of Iowa. Professor F. J. Burrill, in making a journey to St. Louis this spring, noted it all along the road nearly to East St. Louis. The trees in St. Louis were all in perfect health.

Professor Bailey, in the "Horticulturists' Rule-book," speaks of it as attacking the leaves in spring. That is hardly correct, since the damage has been completed or nearly completed the preceding year. The disease attacks the twigs of the current year's growth, nearly girdling them, but leaving them so that the buds can put out and make some growth before they are cut off entirely.

We have something else that is attracting our attention just now. A week ago brown spots were noticed on a hedge of Norway Spruce. On examination it proved to be the work of a spider, probably the same as the red spider of the greenhouse. Since then it has been making its presence known very rapidly. Whole trees here and there are beginning to take on a sickly look. It is hard to predict what may happen as the result of a hot, dry spell of weather such as we are likely to have at this season, but the Norway Spruce would certainly suffer seriously.

Agricultural Experiment Station, Champaign, Ill.

G. W. McCluer.

The Chrysanthemum Fly.

To the Editor of GARDEN AND FOREST:

Sir.—In the autumn of 1888 Mr. W. Rowe, of this city, selected the Chrysanthemum Mrs. F. Thompson as a seed-bearing plant, and placed it in a greenhouse with a number of varieties, mostly single, but exceedingly rich in color. The seed plant, which had only nine flowers, matured a considerable quantity of seed, which in due time was sown, and from which ninety plants were obtained. Out of this lot eighty-one flowered last fall, and at least one out of every four would be worthy of a place in any good collection.

Only one of these seedlings resembles the seed parent in a marked degree, but in form, color and size many of them partake of the characteristics of other varieties growing in the house, making it probable that some agent had carried to the seed-plant pollen of greater potency than its own.

This agent is a fly resembling somewhat the honey bee. It was most abundant in the fall of 1888, and is an industrious little creature, taking its daily rounds among the flowers in search of food. Being interested in it as a co-worker, and desirous to know more of its ways, a specimen was mailed to a friend, who sends the following note:

"The little yellow fly you send is probably *Meredon bardus*, Soy. Its larva is aquatic, and may live in the water tanks about greenhouses. It seems to be fond of the honey of flowers, and is frequently an inhabitant of greenhouses all winter. I give it credit of doing good work for me in crossing Chrysanthemums, consequently I rather encourage its visits.

"This fly is easily tamed, and three years ago I had two in my greenhouse that were so tame that they would come at my call and eat honey from my hand."

New Haven.

A. Veitch.

This matter of the Chrysanthemum Fly was brought to my attention last fall by Dr. John Hamilton, of Allegheny, Pennsylvania, who sent me a specimen for determination. He stated that certain growers of seed had bred this fly, and that the secret of their success was in the fact that by the aid of this insect they secured the most perfect cross-fertilization. The fly was a very familiar one to me, a supposed importation from Europe not more than twenty years ago, but one which has since spread all over the United States. In England it is well known as the "Drone fly," and its technical name is *Eristalis tenax*, Linn. In its early stages it is one of the "rat-tailed" larvæ, so commonly found in the filthiest excrement. The pupal stage is passed just underground, and the mature fly, strongly resembling in size and appearance a honey bee, is very fond of flowers, presenting the most complete change in habit and taste between the larval and imaginal stages. I have commonly found the fly in September on sunny fences everywhere, more especially near outhouses or barns. The secret of their presence in greenhouses is probably found in the presence of manure and compost heaps, which furnish the best breeding places for the larvæ, while the Chrysanthemums, by far the most gorgeous and prominent flowers at that time, attract the fly. There seems to be little doubt of the fact that the fly is an

efficient agent in fertilizing these flowers, but whether it is so exclusive as to merit the term "Chrysanthemum Fly" is quite another question. Dr. Hamilton assures me that seedsmen cultivate this fly and are very averse to give any information concerning it. The breeding is easily accomplished. The flies are everywhere, and a little encouragement in the shape of a filthy and rather shallow manure pit will provide for a full crop without further care. The *Merodon barda* (now *Mallota posticata*, Fabr.) bears a casual resemblance to *Eristalis tenax*, and the latter may have been mistaken for it. The larval habits are similar, and it is not without the bounds of possibility that there are two "Chrysanthemum Flies." *M. posticata*, however, is given a June period by Dr. Williston, who took it on blossoms of Dogwood and Blackberry. As to the distribution, *E. tenax* is recorded from Europe, Asia, Africa, North America and Japan.

John B. Smith.

A Hardy Plant Nursery.

To the Editor of GARDEN AND FOREST:

Sir.—A nursery of hardy plants is rarely more attractive than during the early summer, and any one interested in such plants will be repaid by a visit at this time to any of the establishments where they are largely grown, for a personal inspection will give one a better idea of their value than pages of description. When one is forming a permanent plantation or garden it is desirable to see the various plants well grown and in bloom when possible, as tastes differ materially, and in color especially one's own eyes are the best judges of what is satisfactory.

At the nursery of Mr. H. Meyers, Passaic, New Jersey, I found a few days ago many interesting plants. The Kæmpfer's Iris, partially in flower, made a display of unique bloom. To Mr. Thomas Hogg's first importation of this valuable flower have been added many more of varying merit, so that the collection of varieties here is quite complete. The large, beautiful, flat flowers, poised so gracefully over the reed-like foliage, have a remarkable variation over a somewhat limited range of colors—wine-reds, violet, purple and white. The flowering of *I. laevigata* practically closes the Iris season of the better known kinds. As seen in nursery rows the plants are not as attractive as when planted near water, but one notices sharp contrasts between the plants as to height and time of flowering.

Among other interesting plants in bloom were *Lilium Grayi* (GARDEN AND FOREST, vol. i., 19, Fig. 4), *L. Hansonii*, *L. Chalcedonicum*; Campanulas in great variety; Delphiniums in almost endless species and hybrids, the latter the gayest, though *D. formosum* will probably ever remain the favorite Larkspur. *Platycodon Mariesi*, the new dwarf species, is an interesting plant with large flowers. Its height of eight to twelve inches seems no great advantage, as the old *P. grandiflorum* and its white variety owe somewhat of their grace to their not too long stems. *Aquilegia Canadensis*, var. *flaviflora*, is a curious, though not showy, dwarf variety, with pale yellow flowers. *A. chrysantha* covered great breadths, but their brightness was somewhat dimmed by the yellow composites near. A mass of *Lychnis coronaria* (Mullein Pink), with silvery, woolly foliage and bright magenta flowers, contained also a few sports showing white flowers, with rose-colored pencilings. *L. chalcedonica* and the double variety, as also the white, and *L. Haageana* also represented this favorite flower in bloom. The latter variety, when it does well, is one of the most satisfactory of the family, its colors ranging from faint rose to brightest scarlet, being perfectly clear and distinct.

Two grand plants for sub-tropical gardens were noted; *Senecio Japonicus*, a large yellow composite, with deeply cut palmate leaves, and *Telekia spinosissima*, a wild-garden plant, with Inula-like yellow flowers, and broad, though somewhat coarse, foliage.

Other interesting flowers were *Salvia hians*, a fine blue, dwarfer than *S. patens*; *S. pratensis*; *Spiraea bullata*, the dwarf species with deep green foliage and dark rosy flowers, beautiful for edgings; *S. filipendula*, and its double variety; *Potentilla* in great variety; *Centaurea nigra variegata*, with excellent variegation and red thistle-like flowers; Perennial Peas, the white-flowered variety being one of the most useful and attractive of low vines; Geums, Alliums, Phloxes, Achilleas, those with silvery leaves the best; Coreopses; the graceful Bowman's-root (*Gillenia trifoliata*), and scores besides which might be named if a mere catalogue had general interest.

I must be allowed to mention, however, the curious Mosquito-plant (*Vincetoxicum acuminatum*) from Japan, which might be useful in some places. This is an Asclepidaceous plant with clusters of small white flowers which secrete a viscid juice. They are attractive to mosquitos, which are entrapped as they alight on them. At the foot of the hill just within the shade of the Beeches a colony of *Cypripedium spectabile*, finely in bloom, well repaid one for a journey.

New York.

G.

Periodical Literature.

The June issue of the *Kew Bulletin of Miscellaneous Information* is devoted to articles on compressed or tablet tea, which is manufactured at Hankow from tea-dust, and is now consumed in immense quantities in Russian Siberia. It appears that the volume of the brick tea trade is rapidly increasing and that the demand is becoming greater than the supply. To meet this, steam machinery has been introduced for the purpose of pressing the bricks, with the result that the steam-made article is more compact, better finished, and better able to withstand the long, rough journey it is obliged to make before reaching the consumers in Siberia. The following account of this interesting product is extracted from the report of the Commissioner of Customs at Hankow:

"The first operation is to sift the dust and reject all the sand and rubbish contained in it, usually amounting to about five per cent. It is then placed in a winnowing machine having three different sized sieves, with troughs corresponding, and passed into baskets. The residue, which is too coarse to pass any of the sieves, is taken out and trodden until it is reduced to the proper consistency, when it is placed in iron pans over a charcoal fire until it is sufficiently brittle, when it is again taken to be winnowed, and this operation is repeated until it has all been sifted to the requisite degree of fineness. Three sizes are produced, the coarser ones being employed to constitute the brick, while the finest dust is only used as a facing. The dust having been properly sifted, the next step is to prepare it for pressing, and this is done by exposing it to the action of steam for three minutes, and it is this steaming that robs brick tea of its scent and flavor, and for which a remedy is eagerly sought.

"The old-fashioned native apparatus consists of six iron boilers heated by charcoal, and having spaces above, which are fitted with rattan covers. When the dust is to be steamed it is spread out on a sheet of cotton cloth placed over the boiler and covered up; but with the improved European apparatus the dust is simply put into iron boxes and the steam then passed through them. After having been sufficiently steamed to make it adhesive, the dust is put into a strong wooden mould, on the movable cover of which the trade mark of the 'hong' or firm is engraved (so as to leave the corresponding impression on the brick), and firmly wedged down. It is then pressed and placed on one side for two or three hours to cool. Each brick should weigh one catty (one and a third pounds), and all those that do not come up to the proper standard of weight or are defective in any way are rejected and re-made. For this purpose they are taken to a rotatory mill, constructed of two heavy circular stones moved by a horizontal wooden bar, and working in a channel where the condemned bricks are thrown, and crushed as the wheels pass over them. Having again become dust, the operation already described is in all its details repeated. The hand press turns out sixty baskets a day with twenty-five per cent. of failure bricks, while the steam press produces eighty baskets a day, with only five per cent. of bad work, and the saving by the employment of the improved machinery amounts to one tael a basket, or, according to the above stated out-turn, eighty taels a day, or about £20 sterling. The bricks found to be correct in weight and free from defects are stored in the drying room for a week, when they are carefully wrapped separately in paper, and packed in Bamboo baskets containing sixty-four bricks each. Green brick tea is made in the same manner, but of leaf, not dust, and the bricks are larger, weighing two and a half pounds each, thirty-six going to a basket when packed for export."

There is an important article, too, on the timber-trees of the Straits Settlement, in which the botanical identifications of the trees producing the various timbers are given, with descriptions of these and their weight. One hundred and fifty different timbers are described in this list, the value of which is increased by the addition of an index of native and scientific names. The issue ends with a mass of correspondence carried on by the authorities of Kew with regard to west African cotton, with the view of calling attention to the subject of cotton-growing generally in this part of the world.

The June Exhibition of the Massachusetts Horticultural Society.

THE first of the principal summer exhibitions of the Massachusetts Horticultural Society is devoted primarily to Roses and Strawberries, although it serves to bring together always large collections of the other flowers, fruits and vegetables of the season. This exhibition was held in Boston last week and attracted the usual number of people which the queen of flowers always brings together in that horticultural centre. As far as the roses were concerned, the exhibition must be considered an average one only. Much better roses than those which were shown last week have been seen in Boston, and there have been many years when the flowers fell far below those of this season in quality and in numbers. As usual, the roses were well shown in the English fashion, in flat boxes, the tin cups holding the flowers being hidden by a covering of moss, which makes the best possible setting for the individual flowers. The roses, as a whole, were distinguished by a remarkable evenness of excellence which must have made judging a difficult matter, by good foliage and by flowers well colored but lacking something of substance, and certainly not of such enormous size as these shows have sometimes called out.

The Lyman plate for the best twenty-four named varieties of Hardy Perpetuals went to John B. Moore & Son, the second and third prizes in this class going to J. S. Fay of Woods Holl, a new exhibitor of roses, and to Warren Hustis & Son, of Belmont. President Spooner's special prize for the best twelve blooms of Ulrich Brunner went to Mrs. F. B. Hayes, of Lexington, for twelve very perfect flowers. In the class of twenty-eight distinct named varieties, Mr. John L. Gardner, of Brookline, carried off the highest honors. Very fine specimens of the American Beauty were staged by President Spooner, who also secured the first prize for the best eighteen varieties.

The following is a list of the varieties of Hybrid Perpetual Roses that appeared on the first-prize stands, the figure after some of the names referring to the frequency of their occurrence in different exhibits: Abel Carrière (3), Alfred Colomb (5), Antoine Mouton, Baroness Nathaniel de Rothschild, Baroness Rothschild (5), Beauty of Waltham, Boieldieu (3), Camille Bernardin (3), Catherine Soupert, Charles Darwin, Charles Lefebvre (4), Comte de Paris, Comte de Raimbaud, Comtesse de Chabillant, Countess of Oxford (4), Devienne Lamy, Dr. Sewell, Duchess of Bedford, Duchesse de Bragance, Duchesse de Vallombrosa, Duke of Edinburgh (3), Dupuy Jamain, Earl of Dufferin, Eclair, Edouard Morren, Emily Saxton, Etienne Levet (4), Eugenie Verdier (2), Fisher Holmes, General Appert, General Jacqueminot, Gloire Lyonnaise (2), Glory of Cheshunt, Heinrich Schultheis (2), Madame Alfred Rougemont, Mabel Morrison, Madame Boll, Madame Boutin, Madame Clemence Joigneaux, Madame Eugene Verdier, Madame Gabriel Luizet (7), Madame Julie Daran, Madame Marius Cote, Madame Montet, Madame Victor Verdier, Mlle. Emilie Verdier, Marchioness of Exeter, Maréchal Vaillant, Marguerite de St. Amand, Marie Baumann, Marie Finger, Marquise de Castellane (2), Maurice Bernardin (2), Merveille de Lyon (3), Miss Hassard, Mons. Boncenne (3), Mons. E. Y. Teas, Mrs. Turner, Mrs. John Laing (2), Oxonian, Paul Neyron, Penelope Mayo, Princess Louise (2), Prosper Langier, R. Dudley Baxter (new), Richard Wallace (2), Rosieriste Jacobs, Sir Garnet Wolseley, Thomas Mills (2), Ulrich Brunner (3), Victor Verdier (2), and White Baroness.

A collection of single Roses exhibited by the Arnold Arboretum attracted a good deal of attention, and the beauty of these flowers, judging by the amount of space given up to an account of them in the Boston papers, must have been a surprise to many people.

A few Orchids were shown by Mr. N. T. Kidder, of Milton, Mr. John L. Gardner, of Brookline, and Mr. E. W. Gilmore, of North Easton. Flowering Plants other than Orchids were not of first quality, and it is a commentary on the present state of horticulture in this country when a common scarlet Geranium makes its appearance on the exhibition stage in a class of greenhouse flowering plants.

Among Strawberries, Jewell, a light colored, well shaped berry which many people in the neighborhood of Boston have thought the best Strawberry of the season, won the highest honors, Mr. Samuel Barnett carrying off the Lyman plate with a basket of splendid fruit. Belmont was considered only second to Jewell. Mr. Benjamin F. Smith, of Cambridge, received the Society's silver medal for the best seedling, never having taken a prize, with Beverly. The exhibition of strawberries was, on the whole, very fair; and the size and beauty of the fruit has not been surpassed for many years. Strawberries, however, in

eastern Massachusetts, this season, lack something in flavor owing to the excessive moisture of the season and the absence of sun at the time the fruit was coloring. O. R. Robbins received the first prize, and Edward Hastings the second for two quarts of any variety of Cherries with handsome, well colored fruit of Black Tartarian.

The interest of the exhibition to lovers of wild plants was increased by large collections of these flowers, which are a specialty always at the Massachusetts shows.

Jacob Manning, of the Reading Nurseries, staged a large collection of hardy herbaceous plants, which we should be glad to describe more in detail, if room could be found.

Not the least attractive part of this exhibition was the display of Fox Gloves, grouped on the stage at the end of the upper hall, which produced a remarkable and striking effect.

Notes.

The profits accruing to the government from the sale of the fruit of the trees (chiefly Cherries) planted along the highways of Saxony amounted in the year 1889 to \$35,480.

In making hairpins for ladies' use an excellent aid to the gardener was unwittingly provided. Of many lengths and varying in thickness from a stout to an almost thread-like wire, there is nothing so handy for pegging down plants in the border.

Mr. Barkett, gardener to Lord Penzance, recently received a first-class certificate from the Royal Horticultural Society for a hybrid between the Sweet-Brier and Harrison's Yellow Rose. The foliage is larger than that of the Sweet-Brier, and somewhat fragrant; the flowers are single, two inches in diameter, pale salmon with a yellow centre.

Among the most interesting contributions made in recent years to the history of decorative art have been Mr. William H. Goodyear's speculations on the rôle played by the Egyptian Lotus in the ornamentation of Oriental, classic and more modern nations. Originally presented in lecture form, they have since been published in the *American Architect and Building News*; and now it is announced that they will be reproduced in atlas form, with illustrations of 2,500 objects and details, under the title "Grammar of the Lotus." An English gentleman, persuaded thereto by Miss Amelia B. Edwards, the well known Egyptologist, will supply the money for this costly enterprise.

In a late number of the *Illustrirte Gartenzeitung*, of Vienna, long quotations are made from the articles on *Taxodium distichum*, *Aster ptarmicoides* and *Aralia Cashmirica*, recently published in GARDEN AND FOREST, and to the Arnold Arboretum is given the credit for having introduced the last-named plant to European cultivators. Among the novelties recommended to its readers by the same issue of this journal are a number of plants of American origin; the Snowflake Rose, introduced by the Messrs. Strauss & Company, of Washington, *Ipomæa setosa*, *Euphorbia heterophylla*, introduced by Mr. L. W. Goodell, of Dwight, Massachusetts, and several Pines from our western states and from Mexico, which are not unknown in Europe but have been lost to cultivation in consequence of planting in regions of insufficient warmth.

A correspondent of the *Bulletin of the Torrey Botanical Club* says that half the 12,000 portraits of distinguished men of all times contained in the Wolff Collection of Engravings, recently presented to the Syracuse University, has now been catalogued, and that the list includes the names of 144 botanists. Modern celebrities are, of course, included, but the collection is especially rich in pre-Linnæan portraits. Nor did the collector confine himself to single examples, for six different portraits of Kaspar Bauhin are noted, seven of Erasmus Darwin, fifteen of Humboldt and no less than twenty-seven of Linnæus. Every style of engraving is represented, and the plates vary from duodecimo to folio size. If the University will permit historians and essayists to reproduce these portraits, the collection will be a most valuable possession to the country at large.

In a private letter recently received from Mr. C. G. Pringle, now engaged in exploring the flora of northern Mexico, he writes: "I find myself well located here for exploring the rich region between this city and Tampico. Twice a week at midnight a train leaves here for that place. About eight A. M. we enter the head of a wonderful cañon (3,100 feet elevation), which is full of profuse vegetation. After fifteen miles the train emerges from the cañon at eleven hundred feet elevation and enters the tropical forests of the lowlands. In my

last trip of two days in the upper end of the cañon I gathered five hundred specimens in forty species, half trees, and shrubs. There are a very few species here which I know. I have to come back here to dry my plants, as I can get food and shelter in only a few places below, and the vermin in woods and hovels are terrible pests. The rainy season has set in heavily. All the table-land has been dry and brown so far. My prospects are good."

French journals tell us that the estate of Elven, in Brittany, is offered for sale at the price of \$60,000. A better investment for this amount of money could hardly be imagined if the purchaser cared for picturesque surroundings and historic interest. Elven lies in a romantic country, close to Morbihan, the ancient stronghold of the Druids, near which stand the prehistoric dolmens of Carnac, while Auray, where King Arthur is fabled to have dwelt, is not far away. The estate itself comprises about 450 acres and a fairly well preserved castle with some other buildings. In this castle Henry Tudor, later King Henry VII. of England, was imprisoned when, after his mother's defeat at the battle of Tewkesbury, he was driven by a storm to the coast of Brittany and seized by its Duke. But the present generation will probably be more interested by the fact that it is the half-ruined tower of Elven which plays so prominent a part in Feuillet's "Romance of a Poor Young Man."

American Horticulture and more especially American Pomology has sustained a serious loss in the death of Patrick Barry. For fifty years he has been an active member of the firm which from small beginnings became famous the world over for enterprise, for accuracy and for business integrity. He has been untiring, too, with his pen, and as author and editor he always had some instructive message, and he always delivered it in a way that compelled attention. Many of the best horticultural societies of the country owed much to his organizing faculty and administrative force, so that it might be said that his influence has reached every orchard and garden of the country.

Patrick Barry was born near Belfast, Ireland, in 1816, and, reaching this country at the age of twenty years, he began his life-work as a clerk in the then celebrated nurseries of the Princes, at Flushing, Long Island. Four years later, with small capital, but with the knowledge of the business which he had acquired by a quick intelligence and persevering industry, he formed the partnership with Mr. George Ellwanger, in Rochester, in a business which since that time has constantly grown in power and influence and has become an honor to the nursery trade of the world.

While he was skilled in all branches of horticulture, he was specially devoted to pomology, and forty years ago his first popular work, entitled "The Fruit Garden," placed him in the front rank, with Downing and Thomas, as an authority in this field. Soon after he became editor of *The Horticulturist*, and conducted it with great spirit and intelligence until it was removed to Philadelphia. In 1860 he became Horticultural Editor of the *Genessee Farmer* and for six years was a constant contributor to that journal. For more than thirty years he was President of the Western New York Horticultural Society, a model organization of its kind, in which position he was always ready not only to give it his counsel, his time and his labor, but to make up any deficit in its treasury when its expenses were greater than its income. He has also been a member of the Board of Control of the State Agricultural Experiment Station, and here, as in other positions of trust, he gave his best thought to his labors for others.

Perhaps his most valuable work was the "Fruit Catalogue" of the American Pomological Society, which has been accepted as the standard authority on this subject, not only in this country, but throughout the world. He was Chairman of the General Fruit Committee of this body practically from its beginning, and the Fruit List, which is an exhaustive catalogue of the different varieties of fruits, with their peculiar qualities and degree of adaptation to different geographical locations, was his original conception and was practically carried out by him. But his restless activity was manifested in many other directions. He had accumulated a liberal fortune, and he was identified with the leading financial and philanthropic enterprises of the city of his adoption. Altogether he was a man of rare executive force, sterling judgment, and what was more important, of high character in all the relations of life. Honorable in business, liberal in charities, consistent in his religious profession, he won the hearty affection of those who knew him intimately and commanded the respect and confidence of the entire community.

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The Scenery of New Hampshire.

THE mountain scenery of New Hampshire is one of the most valuable pecuniary possessions of her people. It will yield them increasing profits through all coming time if it is rightly cared for and protected from injury and destruction. The timber can all be utilized without destroying forest-conditions on the mountains, and the great manufacturing interests of the state require the preservation of the forests in the regions where the rivers have their sources. There is no important interest of the state which would not receive advantage from the permanent maintenance and intelligent management of her mountain forests. Is it not strange that our people everywhere are so slow to understand the truth that the forests would yield a great deal more timber if they were rightly handled than they do by the haphazard and murderous methods of lumbering hitherto in use? When we speak of forest-preservation multitudes of men still infer that if the forests are to be preserved, no timber can be cut or used. They seem to think that the only way to have timber for the boundless and increasing needs of the country is by destroying the forests, root and branch, and by the methods of lumbering still largely used the timber-producing capacity of extensive areas of land is every year permanently destroyed.

Timber in New Hampshire, and everywhere else, should be cut and used when it is ripe, when it is at its best. That is what it is for. But it should be cut in intelligent and civilized fashion, so that it will be reproduced again and again in a permanent succession of crops. There is no reason, or good sense, or profit in cutting off all the timber at once, large and small. All forest-lands should be carefully protected from fire, so that the forest-floor, and the soil out of which the trees grow, may not be destroyed. Every forest-fire is followed by the growth of inferior kinds of timber. A fire destroys in a few hours the elements of fertility in the soil which have been slowly accumulated by vegetable action through a thousand centuries of time.

The chief reason for preserving the forests of New Hampshire is the fact that they constitute the principal and essential charm of the remarkably beautiful and attractive mountain scenery of the state. If this scenery is

rightly cared for and preserved it will in a few years be more valuable than the agriculture of the state. While the mountain forest-lands are in private hands they are rapidly disfigured and rendered unsightly by thoughtless and reckless methods of lumbering. Why should not the state at once take steps for the acquisition of all the forest-lands which are essential to the attractiveness of the scenery and to the maintenance of the flow of the rivers of the state? The people of New Hampshire ought to have faith in the future of their state. If they will protect their forests, let the trees grow, and improve their roads they will in a few years have summer visitors and summer residents enough to utilize all the beauty of their wonderful mountain landscapes. Travelers and towns-people from all parts of the country, and of the world, will gladly pay liberal tribute for the privilege of a summer sojourn among the hills. The revenues of the inhabitants will be largely increased, and their lives rendered easier, broader and more interesting. The use of the natural scenery of New Hampshire is to be the great future interest and industry of her people. It will admit of great development and expansion. We do not need to fret about the abandoned farms. Let them grow up to pine timber again. They will then be more valuable than they are now. Many of them ought never to have been cultivated, and if forest-conditions had been maintained on them they would now sell for much more money than they will bring in their present condition. But the forest will reassert its ancient dominion. One of the best things about the country up there is the way the Pine-trees come in wherever the plow stops for a little while. No need to talk about planting trees in that region.

We presume the intelligent and thoughtful men of the state would be glad to see the mountain forest-lands made a public possession, so that lumbering could be carried on in an orderly way, so that forest-conditions might be permanently maintained, the beautiful scenery preserved, and an ever-increasing multitude of summer visitors attracted to the great mountain houses and to the hill farms. But the population of the mountain regions of the state is scarce and scattered. The owners of the forest-lands live in the cities or out of the state. They do not often see each other, and it is very difficult to bring about any conference, general consultation or common action among them. This is indeed the greatest obstacle in the way of needed action for the preservation of the forest and the scenery. The state should have an officer to attend to these interests and to bring about the general co-operation of the people, in view of the increasing demand for timber, and of the approaching expansion of the summer business, not only at the mountain hotels, but on the hill farms.

THE article by the Earl of Meath, an abstract of which is given on page 338 of this issue, is interesting to Americans because it shows how our city parks appear to the eyes of an Englishman who has had much experience in the management of public pleasure-grounds. Some of our American ways are specially commended by the writer, and one of these is the general practice of entrusting the administration of city parks to small boards of commissioners, with ample and almost unrestricted powers. There can be no doubt but that definiteness of policy, with promptness and vigor of action, is made possible by such a government, and perhaps it never occurred to our friendly critic, who has a civilized respect for professional counsel, that a commissioner would undertake the proper work of a landscape-gardener any more than the director of a railroad would attempt to design a drawbridge or build a locomotive. But just here lies the danger of such an administration. If it is urged that only a densely ignorant man would esteem an appointment by a mayor an adequate preparation for the work of designing a park, the answer is that men of fair business ability who have been made park commissioners have on more than one occasion proved that they considered their own crude notions superior to the carefully studied opinions of recognized experts.

But a few days ago two of the Park Commissioners of this city voted to spend at least \$300,000 for the obliteration of one of the most beautiful meadows of Central Park, and that, too, after their attention had been directed to the fact that the great defect of the park is its scanty area of open greensward, and that the greater portion of the turf had been won from the rocks at enormous expense by blasting away the ledges and carting in loam to replace them. They did seek counsel of Mr. Vaux and of Mr. Olmsted, who together designed and constructed the park, and both of these artists not only strenuously opposed the scheme, but gave convincing reasons for their opposition to it; and yet the Commissioners acted in direct violation of the advice they solicited. The meadow is to be sacrificed, if the scheme is not frustrated, in the interest of a sorry collection of animals, although the spot has been shown to be in every way unsuited to their health. It has no water, cannot be properly drained, has not a sunny aspect, is shut off from cool breezes in summer and has no protection against the cold winds of winter. To make ready for the cages 25,000 square feet of rock will need to be blasted out and many of the stateliest trees in the park must be destroyed. The President of the Board admits that he only contemplates a temporary use of the meadow for his colony of beasts, and for this he is willing to spend half a million dollars and leave unsightly wounds upon the face of the landscape, which, with the best of care, cannot be healed in a generation.

No one would think of consulting either of these men about the planning or planting of a country door-yard with a reasonable hope of receiving any advice worth listening to, and yet they have no hesitation about deciding upon critical questions of park design and construction. The fact that they have never had any training or experience in such matters does not restrain them from acting with entire confidence in the soundness of their judgment. They plainly have a supreme contempt for any view which conflicts with their own, and they reject without consideration the advice of the very men who are recognized by all the world as the most competent to give an opinion.

Small park boards, with ample powers, may be preferable to large ones, all things considered. But certainly parks are never free from danger when a majority of the board controlling them consists of two or three men who have no respect for expert opinion, who have no clear ideas of the intricate nature of the problems which must be solved when a park is successfully designed, who do not even understand that any question as to plan or construction can possibly present itself which the average American citizen is not competent to answer off-hand. As a matter of fact, the most serious attacks upon the integrity of our city parks have been organized by the men who were chosen to protect them.

THE Philadelphia *Inquirer* of June 23d mentions the sale of 87,000 acres of forest-lands in Pennsylvania to men from outside of the state, and says that the timber is likely to be cut off in a more sensible manner than if these lands were, as hitherto, divided into many small holdings. It is probable that timber lands in the eastern states would be a more profitable investment for capital than some of the enterprises which have been popular during the last few years, but this depends very much upon the feeling and usages of the communities in which the lands are situated. Pennsylvania has, or had very recently, a law for some of the mountain counties of the state which always brings disaster to forests, a statute permitting cattle to run at large. This leads to the practice of starting forest-fires for the benefit of the pasturage, which results in the destruction of much valuable timber, and in the rapid elimination of the fertility of the soil of large areas. Great injury has already been done in the mountain region of Pennsylvania, and it will be interesting to observe the effect of the improved methods of forest-management which the *Inquirer* thinks will be adopted by the new purchasers.

A Japanese Pot Plant.

READERS of garden literature have in late years become familiar with the descriptions and illustrations of the dwarfed conifers of which the Japanese are so fond. Less is known of their dwarfed deciduous trees, a portrait of one of which appears in our illustration on page 335. It is a weeping double-flowered Cherry, in which the Japanese specially delight, and which they grow in great numbers for the decoration of their gardens, often grafting them to assume curious and abnormal forms, and cherishing them year after year among the most precious of their household belongings.

Our illustration was made from one of a large series of photographs of these plants taken in Japan by Dr. William Sturgis Bigelow of Boston, who has favored us with a set of them.

Water in Landscape-Gardening.

WATER is an essential element in the beauty of a landscape, whether it is presented as sea, lake, river or running brook, and no landscape-gardening can be perfect without its addition in some form. While all admit the grandeur of the ocean and the beauties of the lake, with its ever-changing surface, in the selection of a country home, that spot should have the preference which combines with other advantages a running stream in the form of river or brook. It should be a rapid stream, boiling over a pebbly bed and noisy enough to lull one into healthful slumber as he lies down to rest at night. Just such a stream is the upper Saco, among the White Mountains of New Hampshire, where it rushes over a rocky bottom, through the farm of the elder Crawford, and fills that charming valley with its murmurs. Such a stream is the Tweed at Abbotsford, among the Scottish hills, whose rippling, so dear to Walter Scott, was the only sound, as Lockhart tells us, that on that summer's day broke the stillness of the death scene when the great man passed away.

He is fortunate who, with other elements of beauty about him, can combine upon his own grounds these of which we have spoken, or in the absence of these, even the cool, sparkling spring bubbling up in some Fern-embroidered dell.

But if one cannot possess either the rushing stream or the trickling rivulet, he may in a degree supply their lack or even supplement them by the construction of artificial lakes and fountains. These may be costly enough; but water can be introduced into any garden in a modest way so as to be within the reach of moderate means. Of course the water supply is the first item to consider in the construction of a fountain. If this is provided by a city or town the character and volume of the fountain need only be regulated by the owner's purse. If water comes from a neighboring brook by a hydraulic ram or by means of a windmill, the fountain of course must be regulated by the size of the reservoir. Where this supply is limited, a weeping fountain, which consists of an upper basin into which the water is brought with just sufficient volume to overflow on every side into a larger basin below, is perhaps to be preferred. By carrying the pipe to a level with the outer edge of the upper basin the water may be thrown a little above the surface in a jet, or it may be allowed to boil up in the basin. In material and design such a fountain may be infinitely varied. An inexpensive arrangement was carried out in this way. The vase, or upper basin, was formed of an irregular shaped block of freestone, nearly circular and some three feet in diameter. This was supported upon three blocks of the same kinds of stone placed with apparent carelessness one upon the other, the lowest resting in the centre of a lower basin, which was circular and some five feet in diameter. The blocks were drilled for the passage of the conduit pipe and the whole was rough-hammered. The spray of the water which dripped from the upper basin quite sufficed to moisten the Ferns and aquatic plants set about its base and the color of the freestone was quite in harmony with its surroundings.

A rustic, spring-like fountain when placed amid suitable surroundings and away from buildings, can hardly fail to please. The supply pipe may be concealed behind well arranged rock-work and water can flow or trickle down from stone to stone into a basin below. If these stones are selected from the borders of a stream and are well covered with moss, or from an old stone wall and are encrusted with lichens, the general effect will be greatly heightened. If the interstices are filled with soil an excellent place is provided for the growth of Ferns and of climbing and drooping plants.

A wall fountain is suitable to be placed in connection with

buildings, especially with those where the basements at least are made of stone. A shallow archway of rough brick or of unhammered stone is needed, the conduit pipe being brought to the mouth of a griffin's or of a lion's head placed at the upper part of the arch with the water pouring into a basin below. Where the water supply is still more limited, an effect which is quite pleasing may be produced by allowing the water to drip from a shell in which the supply pipe is introduced down to a larger one and again into a larger one still. In any case English Ivy or *Ampelopsis* may be trained about the arch.

There is no limit to the designs and decorations which ingenuity and taste may devise for artificial fountains. One cardinal rule, however, should in no case be violated. That is, the water should not be made subordinate to the architectural display—and this rule should be observed especially when the water supply is limited. The rule is constantly violated, however, in public grounds and on private estates.

Chestnut Hill, Mass.

Daniel D. Slade.

The Cedars in Europe.

THERE is no difference in the hardness of the Cedar of Mount Lebanon and of that of the Atlas, when these trees are planted in Europe. The two grow well all over southern Europe, although an exception must be made to the hot and exceedingly dry region on the shores of the Mediterranean, where they cannot exist; for it must not be forgotten that the Cedar is a plant of high mountains, which demands a certain amount of humidity, and which cannot bear an exceedingly dry soil. The northern limit of the region where Cedars can be grown in Europe ascends from the east to the west, a well known phenomenon noticed also in the case of many other plants like the Beech and the Holly which do not support an excessively cold climate; and shown in the fact that the mild, rainy winters which distinguish the climate of the Atlantic coast of Europe are singularly favorable for southern trees. The Cedars follow this line and succeed admirably in the parks of Great Britain. Probably nowhere, not even in Syria nor on the Atlas, can such splendid groups of Cedars, relatively young, although already of imposing size, be found as are seen in the gardens surrounding English villas and castles. There is a famous old plant in the garden of the Museum at Paris, now beginning to fail, which is popularly but incorrectly supposed to have been brought home by Tournefort from the Orient. The sandy shores of the lakes which follow the southern slopes of the Alps afford conditions where the Cedars grow perhaps as well as they do in England, although in the north of Switzerland and in the Vosges the Cedar is occasionally subjected to too severe cold, and so perishes perhaps once every ten or twenty years. In Germany this danger is increased and there are in that country only a few sheltered localities where the Cedar can live.

The Cedar of the Atlas is less commonly cultivated than that of the Lebanon. It must be acknowledged, too, that the former, with its shorter leaves and more compact ramifications, is less agreeable in aspect and more severe in outline than the classic tree of Syria. The largest specimen of the Atlas Cedar which I know is in the celebrated garden of M. Thuret, belonging now to the French Government, and directed by the Nestor of French botanists, the venerable and distinguished Naudin. This tree is seventy-five or eighty feet high or more, and very vigorous. The leaves are short and it is easily distinguished at a glance from the Asiatic variety.

The Deodar has in Europe a more restricted range than the other Cedars. It grows well only where such evergreens as the Laurel, the Arbutus and the Laurel Cherry thrive—that is to say, along the Atlantic coast as far north as southern England and in the region of the lakes south of the Alps. Here it is a tree of great beauty, far more graceful than its congeners of Syria and of the Atlas; it is distinguished by its longer and richer leaves, and by its slender, graceful branches, pendent like those of the Weeping Willow, and by its enormous size. It is, however, on the shores of the Lake of Geneva at the extreme limit of the region where it can be grown successfully as a tree, although north of the Alps it is possible to have graceful young plants during several years. Sooner or later, however, generally once every five to six years, these plants either suffer badly or are killed outright by a severe winter, just as the Araucaria of Chili and the Fir of the Himalayas are killed occasionally.

In order to realize how beautiful trees can be, one should see the Deodar in some of the gardens on the shores of Lake Maggiore, growing with the most beautiful evergreen in the world, the *Magnolia fœtida*, which flourishes so well there, and which is covered year after year with its immense

flowers, which appear to float on the shining, dark green mass of foliage like Water Lilies on the dark mirror of some lake hidden in the forest. This union of the most beautiful conifer of the east with the most beautiful evergreen of the New World is, without doubt, the most delightful effect of vegetation which that fortunate region of the Italian lakes can offer. The Riviera of Geneva, although hotter, is too dry for the satisfactory development of such delicate trees; but would it not be possible to bring them together in Carolina, or Florida, or Louisiana, in the country of the Magnolia?

Bâle, Switzerland.

H. Christ.

Notes on North American Trees.—XVIII.

Description of the Wood of Certain Species.

A CRITICAL examination of the wood produced by the trees of the United States formed part of the investigation of the forest-wealth of the country made in connection with the taking of the tenth census. Mr. S. P. Sharples, a special agent of the department, had immediate charge of this branch of the investigation, the results of which appeared in volume ix. of the Final Reports of the Tenth Census, pages 247 to 481.

One object of this investigation was to determine the fuel value of the woods of our trees. It was found impossible, however, to obtain at the time it was made the wood of a few rare trees; and a number of others have been discovered since it was completed. The wood of several of these I have now received from the American Museum of Natural History, in New York, for examination. This material has enabled me, through the liberality of Mr. Morris K. Jesup, the President of the Board of Trustees of the Museum, whose interest in the forest-products of this country is testified to by the superb collection of American woods he has caused to be placed in the Museum, to continue the experiments necessary to determine the fuel value of the woods which were not included in the census report. The calculations have been made by Mr. Sharples, who has used the methods adopted in the Census investigation.

The wood specimens used for specific-gravity determinations were 100 millimeters long and thirty-five millimeters square, and were dried at a temperature of 100 degrees centigrade until they ceased to lose weight. The specific gravity was then obtained by measurement and calculation from the weight of the blocks. The determinations of ash were made by burning small dried blocks in a muffle furnace at a low temperature. The relative fuel values were obtained by taking the percentage of ash from the specific gravity and are based on the hypothesis that the value of the combustible material of all woods is the same.

The woods will be taken up in the botanical sequence of the trees which produce them, the descriptions being made uniform with those of the Census report.

The wood of a few North American trees has not yet been examined. The first of these is *Gordonia Allamaha*, an exceedingly local species of Georgia, and last seen growing in its only known station a hundred years ago. Recent attempts to rediscover it have proved futile and it is now only known in cultivation. Other species whose woods we have not been able to examine yet are *Rhamnus crocea*, var. *insularis*, *Pithecolobium brevifolium*, *Aralia spinosa*, *Fraxinus cuspidata*, *Quercus Leana*, *Quercus Macdonaldii*, *Quercus Morehus*, *Juniperus flaccida*, *Pinus latifolia*, *Pseudophœnix Sargentii*, and an apparently arborescent Palm of the Florida Everglades, of which I have only seen a leaf and a slender stem. These species either are not represented in the collection, or the specimens do not afford suitable material for such investigations. The wood of *Pseudophœnix* decays so rapidly after it is cut that it was impossible to determine its specific gravity. *Juniperus flaccida* is a Mexican species only seen within the limits of the United States in a single, very inaccessible region of western Texas. *Pinus latifolia*, the latest addition to the trees of the United States, is only known in a single locality of the Santa Rita mountains of Arizona, and has only been seen by its discoverer, Dr. H. Mayr. The wood is not known. *Quercus Leana*, at one time believed

to be a natural hybrid, but now, perhaps, best considered a species, as it is found occasionally in widely separated regions, is not yet in the collection. The other Oaks are still doubtful California species, of which comparatively little is yet known.

The following species are contained in Mr. Sharples' new investigation:

Helietta parvifolia. Wood hard, very heavy, close-grained; layers of annual growth marked by several rows of minute open ducts; medullary rays numerous, very obscure; color light orange-brown, the sap-wood rather lighter colored; specific gravity, 0.8785; ash, 1.83, 1.90, average 1.87; weight per cubic foot, 54.75 pounds; fuel value, 0.8621. Collected by C. G. Pringle in the valley of the lower Rio Grande.

Koeberlinia spinosa. Wood very hard, heavy, close-grained; layers of annual growth faintly marked with numerous minute open ducts; medullary rays thin and obscure; color dark brown more or less streaked with orange, turning nearly black with exposure, the sap-wood clear, pale yellow or nearly white; specific gravity, 1.1062, 1.1344, average 1.1201; ash, 0.16, 0.25, average 0.21; weight per cubic foot, 69.80 pounds; fuel value, 1.1177. Collected by C. G. Pringle in the valley of the lower Rio Grande.

Ilex monticola. Wood hard, heavy, close-grained; layers of annual growth hardly distinguishable; medullary rays numerous, thin; color creamy white; specific gravity, 0.6746, 0.6379, average 0.6562; ash, 0.41, 0.56, average 0.49; weight per cubic foot, 40.90 pounds; fuel value, 0.6631. Collected by F. H. Boynton, near Highlands, North Carolina.

Ceanothus velutinus, var. *arboreus*. Wood heavy, hard, close-grained; layers of annual growth clearly marked with broad bands of minute open ducts with irregular groups of ducts between them; medullary rays thin, very obscure; color light reddish brown, the sap-wood nearly white; specific gravity, 0.7781; ash, 2.05; weight per cubic foot, 48.49 pounds; fuel value, 0.7622. Collected by T. S. Brandegee on Santa Cruz Island, California.

Rhus integrifolia. Wood heavy, hard, containing numerous scattered open ducts; layers of annual growth distinctly marked with broad, open ducts; medullary rays thin, numerous, very conspicuous; color bright clear red; specific gravity, 0.7500, 0.8160, average 0.7830; ash, 0.20; weight per cubic foot, 48.80 pounds; fuel value, 0.7815. Collected by C. R. Orcutt in Lower California.

Cercidium floridum. Wood light, soft, close-grained, satiny, susceptible of a good polish; layers of annual growth marked by one to three rows of open ducts; medullary rays numerous, thin, conspicuous; color pale yellow faintly tinged with green, the sap-wood rather lighter colored; specific gravity, 0.5217, 0.5149, average 0.5483; ash, 2.66, 2.21, average 2.44; weight per cubic foot, 34.17 pounds; fuel value, 0.5348. Collected by C. G. Pringle in the valley of the lower Rio Grande.

C. S. Sargent.

New or Little Known Plants.

Ptelea aptera.

THIS plant, a native of Lower California, is interesting from the structure of the fruit, which differs from that of the other species of this small North American genus. In other *Pteleas* the indehiscent fruit is surrounded by a broad reticulate-veined wing, while in *Ptelea aptera* it is turgid, nut-like and glandular, and quite wingless, or with a narrow rudimentary wing only.

Ptelea aptera is a densely branched, pungently aromatic shrub, with slender stems growing to a height of five to fifteen feet and forming dense clusters. It is quite similar in habit and in general appearance to the common *Ptelea angustifolia* of the southern and south-western states, and, except for the fruit, might almost be mistaken for that species.

The fruit is broadly ovate, lenticular, and slightly keeled; it is wingless or nearly so, a quarter to half an inch long, and a quarter of an inch broad; slightly emarginate at the

base, tipped with the remnants of the persistent stigmas, and conspicuously glandular. It is two or rarely three-celled. The seeds are oblong and corrugated, with a shining black testa.

Ptelea aptera was discovered in January, 1883, on dry gravelly slopes near the shore at Punta Banda, at the southern end of Todos-Santos Bay, by a party of botanists under the leadership of the late Dr. C. C. Parry. Flowers and remnants of the fruit of the preceding year were found at this time. Dr. Parry read an excellent account of the plant with diagnostic characters before the Davenport Academy of Science in December, 1883. This was afterward published in the proceedings of the Society (iv., 39), the ripe fruit, in the meantime, having been collected by Mr. C. R. Orcutt, of San Diego.

Our illustration (see page 333) is from specimens collected by Messrs. Parry and Orcutt and preserved in the Gray Herbarium of Harvard University. C. S. S.

Plant Notes.

Some Recent Portraits.

THE most interesting plant, from a garden point of view, figured in the June number of the *Botanical Magazine*, is the Japanese *Rosa multiflora* (t. 7119), one of the most beautiful of all hardy flowering shrubs. It was first made known more than a century ago, but only found its way into gardens very recently, a fact which adds to its interest, especially as some of its double forms have been for years familiar garden ornaments. A figure of this Rose, from a drawing made by Mr. Faxon, has already been prepared for GARDEN AND FOREST and will be published during the present summer with a fuller account of it than it is now desirable to give.

The same number of the *Botanical Magazine* contains a figure of a beautiful warm-house climbing plant—*Allamanda violacea* (t. 7122). This species, which is a native of Brazil, differs principally from the other *Allamandas* known in gardens in the color of the flowers, which are rich rosy purple. *Allamanda violacea* was cultivated in England as long as thirty years ago. It was soon lost, however. Fortunately, the plant was kept alive in the Botanic Garden of Natal, whence it has been sent to England again, where it flowered at Kew last autumn. It is a very desirable and beautiful plant, demanding the treatment under which the other species flourish, and well worth growing with them on account of the color of the flowers.

There are figures also of a *Carludovica* (t. 7118) of unknown origin, for which the editor proposes the name of *C. Caput Medusæ*; of *Hemiorchis Burmanica* (t. 7120), representing a genus of *Scitamineæ*, of which only a single species is now known and which possesses little value as a garden plant; and of *Tillandsia amethystina* (t. 7121), from southern Brazil.

Monsieur Carrière describes in the *Revue Horticole* of June 1st a curious semi-prostrate form of the Norway Spruce under the title of *Picea excelsa reflexa* (f. 73). This was one of the interesting plants shown by Croux & Co. at the Paris Exposition of last year. It forms a bush only a few feet high, with irregularly pendulous branches, a habit which particularly fits it to spread over rocks or to plant in rocky situations.

The *Gardeners' Chronicle* of the 31st of May contains the reproduction of a view taken in a Garden of the Scilly Islands, in which is growing a splendid mass of *Puya Chilensis* (f. 115), one of the most beautiful of all Bromeliads. The leaves form a great Agave-like cluster, from the centre of which rises a tall flower-stalk, terminated by a dense head of bronze-blue flowers of exceeding beauty. This would certainly be an admirable plant for California, although it is hardly probable that it would thrive in any part of the eastern states.

There is in the same issue a figure (672) of the male flowers of *Abies bracteata*, here figured for the first time from a specimen grown in the gardens of Eastnor Castle. This tree, an inhabitant of a few sequestered valleys only, in the very heart of the Santa Lucia Mountains in California, is the most limited in its range as it is one of the handsomest of all the Silver Firs. The long, remarkably broad leaves are very striking, and the cones, with their long exserted bracts, are quite unlike those of any other species. *Abies bracteata* is one of the most tender of all the Firs, and there are only a few sheltered situations in Great Britain and in the south of Europe where it has been found entirely satisfactory. It is, unfortunately, quite tender in all parts of the eastern states where it has yet been tried.

The supplement of the *Gardeners' Chronicle* of the same date represents a magnificent specimen of *Dendrobium Devonianum*, grown at Arddarroch, in Scotland, with 864 flowers. This is considered a difficult plant to manage, and it is rarely seen in collections in good condition. The secret of its successful cultivation seems to consist in growing it on rapidly as soon as the flowers have faded and then giving it a long rest in a cool, airy house, that the deciduous leaves may ripen and fall and the pseudo-bulbs become thoroughly matured.

Foreign Correspondence.

London Letter.

NEW PLANTS.—In an appendix to the *Kew Bulletin* for June a list is given of all the new plants introduced into cultivation during 1889. Not only English, but Continental and American publications, have been consulted in compiling this list, which is therefore as complete as is possible. In addition to new

petals, which spread to a width of four and a half inches; the sepals are broad, and the lip is formed as in *C. niveum*. The color of the whole flower is pure white, with numerous red spots arranged in lines on the sepals and petals. A plant of it was recently awarded a first-class certificate by the Royal Horticultural Society. Like all the hybrids of which *C. niveum* is one of the parents, *C. Aylingii* is elegant in the form of its flowers and pretty in color. Except in the markings of the flower, there is very little of the character of *C. ciliolare* in the hybrid. I am told that the owner has asked 600 guineas for this hybrid!

Odontoglossum Galcottianum is merely a variety of *O. nebulosum*, differing from the type only in being much smaller in flower and unspotted on the sepals and petals. It was shown here last week as a new plant.

Masdevallia muscosa. The plant at Kew of this exceptionally interesting species flowers freely at least twice a year. It is in bloom now, and its shaggy scapes, curiously formed flowers and highly sensitive labellum attract a good deal of



Fig. 45.—*Ptelea aptera*.—See page 332.

plants brought into cultivation for the first time, all re-introductions of any note are included. A plant may have been in cultivation several years before its introduction is recorded. Such plants as Palms and other foliage plants which do not flower until large, are often well known in gardens under garden names, whilst botanists are unaware of their existence. The Kew list is of special value for the following reasons: Reference is given to the publication in which the plant was first mentioned or described. Besides the natural order and country, a brief description of each plant is given. In every case the plant is cited under its published name, although the name may be doubtfully correct; corrections are, however, given where possible. The name of the garden where the plant was first noted is also stated. It will be seen from this that as a reference list for botanists as well as horticulturists this publication is specially valuable. Similar lists were prepared for 1887 and 1888. The cost of each is only twopence, and the publishers are Eyre & Spottiswoode, Fleet Street, London.

Cypripedium Aylingii is one of the prettiest of hybrids. Its parents are *C. niveum* and *C. ciliolare*, and it was raised in a garden at Enfield. In habit and foliage the plant resembles *C. niveum*, but the flower partakes of the characters of both parents. It has broad, slightly twisted and curved

attention. The species is very rare in cultivation. Botanically it is of the highest interest from its being the only *Masdevallia* in which the character of sensitiveness is known; indeed one might almost say the only Orchid with this character, that mentioned by Darwin as occurring in Australia being practically unknown.

Another of the famous collections of Orchids recently formed in England is about to be sold by auction. I refer to that formed by Mr. F. G. Tautz, at Studley House, Hammersmith. This collection is especially rich in rare *Cypripediums*, *Odontoglossums* and garden Orchids generally. It would appear that Orchids, like horses or pictures or other luxuries, may become too expensive, so that with every collector who goes on with them there are others who tire of them, or find the pace too hot. Whilst the number of large representative collections of Orchids in England is probably decreasing, there are, on the other hand, hundreds of small select collections of recent formation. Some amateurs make a specialty of one or two genera such as *Masdevallia*, *Cypripedium*, *Cattleya* or *Lycaste*, growing all the kinds obtainable. In the interests of horticultural botany, the work of these specialists is valuable from the fact that it is better to do one thing well than to do a dozen indifferently.

Several good varieties of *Hydrangea hortensis* have lately been added to those which for many years have ranked among the most useful of garden plants. The best of the new ones is called *H. rosea*, under which name it has lately been exhibited by the Messrs. Veitch. It appears to be a variety of *H. Japonica* rather than of *H. hortensis*, but the size, compactness and form of the flower-heads resemble those of the last named. Its charm is in its color—a rich blush rose, almost a red. It is by far the most attractive of the *Hydrangeas* grown here. The leaves are broad, with deeply toothed margins, and a soft, deep green, as in *H. Japonica*. As a market plant this variety is certain to become very popular. Another new addition is one called *H. cyanoclada* in some gardens, but which is properly *H. hortensis*, var. *Mandshurica*. It is distinct in having its stems colored purplish and in the flower pedicels being deep rose-red, contrasting prettily with the creamy white of the flowers themselves. *H. stellata flore pleno* is a curiosity rather than a good decorative plant. In the large temperate house at Kew, *Hydrangeas* are a pretty feature at this time of year. The varieties of *H. Japonica* are particularly ornamental, as they form loose, elegant bushes, whilst their flower heads are handsome, though not so massive as those of the *H. hortensis* forms. A variety of the last named known as Dr. Hogg is represented just now by a handsome bush four feet through and bearing dozens of heads of white flowers. *H. Thunbergii*, *H. paniculata*, *H. acuminata* and *H. Lindleyana* are also grown in this house. For covering pillars or clothing a wall there are few better plants than *H. altissima*, oftener called *H. scandens* and almost invariably the plant grown as *Schizophragma hydrangeoides*, the genuine plant of this last named Japanese shrub being scarcely known in English gardens. *H. altissima* is hardy in the warmer parts of England and is a most useful wall creeper.

Clematis Stanleyi. This very interesting plant is showing flower at Kew. Although figured in *Hooker's Icones Plantarum*, t. 589, where it is described as the most beautiful of the genus, it does not appear to have ever been introduced into gardens before now. It is a native of Lower Guinea, Macalisberg, and the Transvaal, where it forms a shrub two to four feet high, more or less caespitose and woody at the base. A correspondent in Barberton describes it as being as handsome and free flowered as *Anemone Japonica*. The flowers are three inches across, and are composed of from four to six broad sepals forming a shallow cup, purple or pinkish in color, with yellow stamens. The heads of fruit are beautifully silvery, "a spray looking not unlike a bunch of ostrich feathers." The leaves are decompound. It is possible that from the high altitude at which this species is found it may prove hardy in England.

The Foxglove as a garden plant is really first rate. Several large beds on the lawn as well as masses in the borders here are simply glorious. If some plant-breeder would take the Foxglove in hand and produce a variety of color in the flowers, what a value this common British hedge-row flower would have in the garden. As it is there are few if any amongst the wealth of herbaceous plants at Kew that can be called superior to the Foxglove as an ornamental garden plant.

London.

W. Watson.

Cultural Department.

Notes on American Plants.

Galax aphylla, which is closely related to the *Shortia galicifolia*, is a reliable little evergreen, a native of the southern states. Its numerous round, heart-shaped, crenately toothed leaves are at first of a bright, shiny green color, but as the season goes on they turn to a rich reddish brown. The naked scape, which is a foot or more high, bears at its summit a spike of pretty white flowers. This spike is about three inches long by a third of an inch thick. It is a plant that needs time to become established before it will show to its best advantage, but it is not difficult to grow in a thin shade and a fine soil.

Thermopsis Caroliniana, one of the Pulse family from the mountains of North Carolina, has its flowers in a long, thick raceme or spike sometimes ten inches long by more than an inch thick. The plant itself is often five feet high and the flowers are of a rich, bright yellow and in shape resemble those of a pea. These large racemes are admirable for cutting. It seems to be perfectly hardy and is a desirable plant for warm, sunny situations.

Phlox amœna, formerly known as *Phlox procumbens*, is with us the last species to flower. It is a native of dry hills and barrens of Virginia, Kentucky and southward; yet it is perfectly hardy in southern Massachusetts. The stems grow from six to eighteen inches high and bear a close sessile cyme of pink-

ish purple, or sometimes white flowers, half an inch wide. It is the more valuable for blooming after the other natives of this genus are out of flower. It does well in any ordinary soil and might be useful on dry banks where few other plants would thrive.

The little one-flowered *Pyrola (Moneses uniflora)*, one of the Heath family, closely resembles a *Pyrola*, except that it has only one flower. The leaves, usually three, are clustered near the base. The flower is one-half to three-quarters of an inch wide, usually white, but sometimes rose colored, and usually nodding on an almost naked stem three to five inches high. It grows in cool woods, usually under Pines. Though somewhat difficult to establish it is well worth a trial. It must have a firm soil in the shade and a mulch of Pine needles about its roots will be beneficial.

Two very interesting Pitcher plants, *Sarracenia flava* (Trumpet Leaf) and *S. Drummondii*, have both flowered. The former is a native of Pine barrens from Florida to North Carolina. Its leaves are trumpet-shaped, large and erect, are often two feet long, and its scape bearing the single flower is about the same height. Its flower is yellow, from three to five inches wide and quite pretty. The latter species is a more southern plant, growing from Florida to the middle of Georgia and westward. Its height is a little more than two feet. The leaf is nearly two feet in length and as beautiful in its variegation at the summit as a flower. The flower, which is single at the end of the naked stalk, is sometimes three inches wide and purple in color. Both species are easily grown in boggy soil, and after being established seem quite hardy. Their beautiful leaves alone would well repay the trouble of establishing them. They must have a wet, sandy or peaty soil and full sunlight. Until well established they should be protected by a mulch of leaves in winter, and even after this they will stand the severe cold better if covered. The covering is not so much to protect them from severe frost as to prevent the thawing and freezing alternately in open weather.

The Lizard's Tail (*Saururus cernuus*) is a perennial herb not uncommon in swamps. It grows a foot or more high and bears a dense spike of fine white flowers which endure for several days. The spike is six inches or more in length by half an inch thick, at the summit of a naked stem, and might be useful for cutting. It thrives in the shade, in any light moist soil.

Thalictrum purpurascens (Purple Meadow Rue) is quite common in parts of southern Massachusetts, where it is frequently found growing on sandy soil with the Tall Meadow Rue of our northern wet meadows. Its most natural location according to Gray's description is "dry uplands and rocky hills." It is a slimmer plant than the common one, with purplish stem and fewer leaves. It is easy of culture, and would, no doubt, thrive in much drier soil than the other species. The delicate purple and white flowers are quite pretty for bouquets, and the purple stalks, which are scarcely hidden by the thin foliage, make it a pretty garden plant.

Calochortus luteus from California is one of the many little beauties of this rich genus. Its usual height is about a foot, bearing one to three erect yellow flowers over an inch wide. A brownish stripe crosses the lower half of each petal, below which it is covered with short but stout yellow beards. It is a good species for cutting and the flowers are unlike most of the yellow sorts. It is intermediate in time of flowering. It needs a fine, light soil, with protection in winter. Another interesting species quite unlike the above is *C. splendens*, which flowers about the same time. This grows two feet high, bearing in succession five to ten large pale purple flowers two inches wide on ample stems for cutting. In some ways it is much like *C. longibarbus*, formerly mentioned, but is not so thrifty a plant in this climate, and few of this genus are, but it cannot fail of being admired by all who see it in flower. It should be treated like the others with protection in winter.

Habenaria fimbriata, one of the Purple Fringed Orchids, is a species that is well worthy of cultivation and has been exported to European dealers in considerable quantities. It is often taken for *H. psycodes*, which it somewhat resembles. But its time of flowering is much earlier, and its spike is smaller, with much larger flowers. The lilac-purple flowers are very showy and endure for many days. It is found in wet meadows and swamps, coming into flower the last of June or early in July. It must have a wet or moist situation, and a thin shade is better. For artificial bogs this plant is very useful and it will thrive in the sun in such wet soil.

Iris Virginica (Slender Blue Flag) is a very slender species a foot and a half high, with long, narrow, grass-like leaves and small violet-blue flowers. It is a native of marshes near the coast from Maine to Virginia. It is not so easy to establish as

our common *I. versicolor*, nor so valuable a plant. It does fairly well in a light soil and sun.

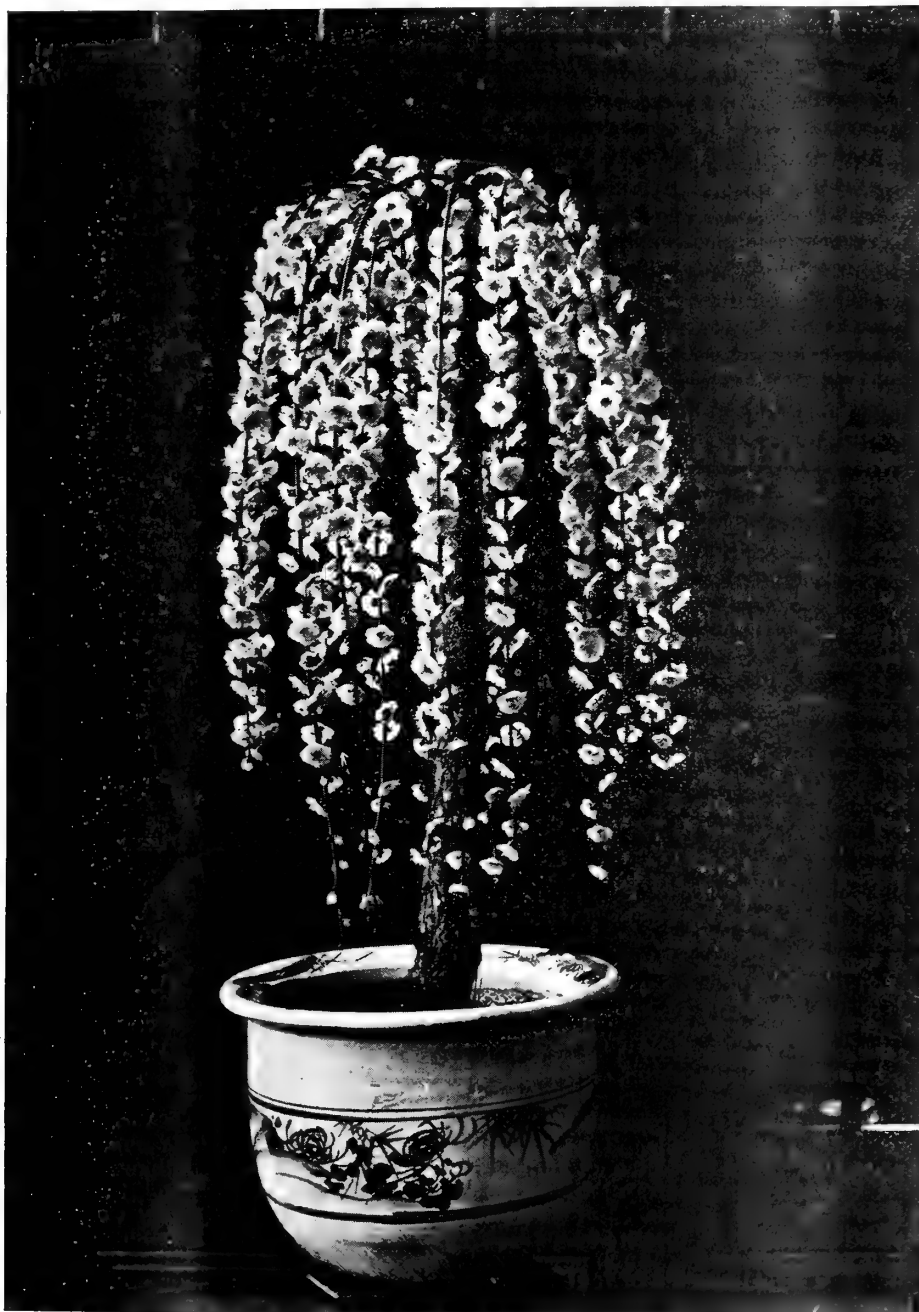
Brodiaea grandiflora is one of the finest of the Brodiaeas, growing from eight to twelve inches high, and bearing an umbel of five to ten large blue flowers an inch wide, with darker stripes. They not only come in succession, but each endures for a long time. The plant shows much more thrift in this climate than most of this genus. The leaves, at the time of flowering, when they are dried up in some species, are as fresh and green as at any season. We suppose it is not hardy without protection in winter. A light loamy soil in the sun should be selected. This species is one of the last to bloom.

Southwick, Mass.

F. H. Horsford.

firm perhaps fifteen years ago. The best system to follow in the cultivation of these plants is that of planting them out, the shoots being trained along wires stretched across the rafters, and as the flowers are pendent and usually produced on long, slender stems, a very pleasing effect may be thus procured.

As regards soil the Tacsonias are not very fastidious, and a good sandy loam, well drained, is sufficient for their needs, though the judgment of the cultivator should always be used in deciding this question of soil, as in some localities the loam may be found too heavy for plants of this character, and the addition of about one-third of peat may prove very beneficial under such circumstances.



A Japanese Pot Plant.—See page 330.

Greenhouse Climbers.

THE genus Tacsonia of the Passion Flower family includes some of the most beautiful and graceful climbing plants in cultivation, and being mostly of easy growth, they deserve more general use in the furnishing of conservatories than has been accorded them, at least on this side of the ocean. The Tacsonias are natives of Central and South America in most instances, though one fine variety, *T. Exoniensis*, is of garden origin, being a hybrid between *T. Van Volxemi* and *T. mollissima*, and was introduced by a London

An intermediate temperature (that is, about fifty-five degrees) is quite warm enough, and thorough syringing is necessary to prevent the inroads of red spider, this pest being very partial to the Tacsonias. Probably the oldest and certainly one of the best examples of this family is one of those already referred to, *T. Van Volxemi*, a native of New Grenada, which has large, bright crimson flowers, very freely produced on a well-established plant, and hanging down on slender footstalks from one foot to eighteen inches in length. These flowers are frequently followed by fruit, which has some slight resemblance to an elongated Green Gage Plum, though without

the stone. The fruits, like many others among the Passifloraceæ, are edible, though not specially pleasant in flavor.

Tacsonia Exoniensis is also a very handsome sort, and resembles the preceding in foliage and habit, but the flowers are of a different shade, being inclined to magenta. It is also a good grower and the flowers hang down in the same graceful manner as those of *T. Van Volxemi*.

T. Buchananii is another excellent species, and produces large and showy bright scarlet flowers in great profusion after the plant has attained considerable size.

It is rather a rampant grower and is consequently not so well adapted for planting in a small conservatory as the varieties above mentioned, but where sufficient space can be given for its full development it will prove a remarkably effective creeper. It has large, dark green leaves, which are somewhat tomentose, and divided into three or five lobes, and reminds one quite strongly of some of the strong-growing Passifloras; in fact, this plant has also been named *Passiflora vitifolia* in some catalogues.

The Tacsonias are easily reproduced by means of cuttings or by seeds when the latter are procurable, but cuttings of moderately soft wood and two or three joints in length are readily rooted in a propagating frame. The advantage of using cuttings of three joints in length is found in the fact that they often start away quicker than those which are made with only one or two eyes, as the latter sometimes fail to start on account of the buds being defective.

Stigmaphyllon ciliatum is an admirable summer-flowering creeper from Brazil that deserves a much wider distribution than it has yet received. It is a rather slender-growing plant with medium-sized cordate leaves of a grayish-green color and ciliated around the margins. The flowers are produced in rapid succession along the stems and last for a considerable time, being of peculiar form and orange-yellow in color. This plant used to be considered a proper subject for stove treatment, but of late years it has been found that it flourishes in an average greenhouse temperature, and in fact it has proved a beautiful addition to the out-door climbers, at least as far north as Washington, District of Columbia. I saw at the Botanic Garden in that city some years ago a plant against a fence, over which it ran wild, and being well clothed with its bright blossoms, was a truly charming sight. *Stigmaphyllon* is also propagated by cuttings, and will flourish under similar general treatment to that recommended for Tacsonias.

Holmesburg, Pa.

W. H. Taplin.

Notes on Shrubs.

ONE of the most useful and valuable shrubby plants for use as an undershrub in waste places, or on embankments where not too sterile and dry, is our native *Rubus odoratus*, better known as the Purple Flowering Raspberry, or in some districts as the Thimbleberry. The last popular name, however, is more properly applied to the Black Cap or Black Raspberry (*R. occidentalis*). The Purple Flowering Raspberry is more suited to be planted in free places, where it may spread, than it is in small well-trimmed garden-beds or shrubberies, because of its habit of spreading from the roots and occupying much ground to the exclusion of lower and less robust vegetation. The foliage, although not of such a handsome green as that of some other equally hardy plants, is yet very attractive by its large size and density, and also for being usually little injured by leaf-eating insects. This plant is naturally at home in hilly districts or further north, where it delights in more or less stony, but fertile, soils. The fruit is usually considered almost worthless, yet it is often of quite a pleasant but peculiar flavor, and in some parts of Canada is sometimes collected and sold by the habitants. But it is so thin and flat, and so soft when fully ripe, that collecting it is not profitable, and it does not bear keeping or much handling. In cultivation here it is usually after the middle of June before the large, handsome, purple flowers appear, and the plants continue to bear some flowers even after the fruit begins to ripen early in August.

The first flowers of this species, however, are preceded two or three weeks by those of the White Flowering Raspberry (*R. Nutkanus*), which is found at home from northern Michigan westward through the Rocky Mountains. Although a native of pretty high latitudes, this species has not been hardy enough at the Arboretum to withstand the cold of our winters when growing side by side with the Purple Flowering Raspberry. Owing to a mild winter and careful covering, the stems were not killed last season, and flowers have been freely produced for the first time. It is possible that the lack of hardiness may be obviated by procuring seed from the ex-

treme northern limits or most severe climate where the plant grows naturally. The seed of those in the Arboretum was collected in Washington Territory. In most of its characters this species is almost equal to a white *R. odoratus*. The silky white petals are not quite so large and long, but the flowers expand from an inch to an inch and a half across. They have a sweeter and more delicate fragrance than the purple flowered species, and, as in the latter, a pleasant resinous quality, which, emanating from the sticky glandular hairs covering the young shoots and sepals, is mingled with the odor of the flowers.

The beautiful white flowered Rocky Mountain Bramble (*Rubus deliciosus*) chiefly differs in habit from both of the preceding species in not spreading over the ground by new shoots from its roots. It is perfectly hardy when growing beside the more tender *R. Nutkanus*, which it far surpasses in beauty of blossom. The flowers are flat and about two inches across, and are usually mistaken for large Wild Roses or the Cherokee Rose by people who have seen the latter. The odor of the blossoms is slight and rather pleasant, although it has been happily compared with the smell of bleaching cotton. It is an early flowering species, and here it is usually in its finest condition of bloom about the twentieth of May. In warm situations the first blossoms appear in the first week of the month. The plants in this region do not appear to produce much fruit, and that only rarely. As they do not spread by suckers or great enlargement from the original shoots they are not easily propagated by root division; and cuttings from the wood do not readily form roots and grow; nevertheless the last is the best method of increasing the stock, unless it is by seed.

Few trailing plants combine a prettier effect of foliage and flower than the Running Swamp Blackberry (*Rubus hispidus*) when in good condition. Although its common name suggests wet places as its natural haunts, it will grow well in any good garden soil, and is especially valuable for planting in rockeries. The flowers are borne throughout most of the month of June. They are effectively set off by the dark evergreen looking foliage, which has an added value in the bright colors assumed in autumn.

The Dewberry (*Rubus Canadensis*) often makes a pretty covering over the ground, but the leaves are not of such a handsome dark green as those of the last species. The Dewberry was long neglected by horticulturists, and has only within a very few years received much attention as a fruit-bearing plant. In a wild state the fruit is very variable in size and flavor, but by selection and under cultivation it is possible to produce berries which, for size and flavor, cannot be distinguished from some of the best blackberries.

The earliest ripe fruit on any of the genus is that borne by the herbaceous Dwarf Raspberry (*R. triflorus*), which in cultivation ripens the first of its amber-colored berries before the middle of June. The fruit is small and of a pleasant acid flavor, but is not abundant. This species, though pretty and delicate, has no peculiar characters which make it of much ornamental or economic value. In flower, foliage and fruit it appears to have closer affinities with the Blackberries than the true Raspberries.

Arnold Arboretum.

J. G. J.

The Rock Garden.

A BLUE variety of *Viola cornuta*, known as Perfection, and the white variety, Alba, are being extensively used this season by landscape-gardeners in the vicinity of Boston for summer bedding. These Violets are intended to supplement the blue and white *Lobelia erinus*, which seldom blooms well during wet seasons. Both are free and persistent bloomers, and being quite hardy are fit subjects for the rock garden. Rock Roses, *Helianthemum vulgare* and its varieties, are, if not exactly showy, very pretty and interesting. These are easily propagated, either from hard wood cuttings placed in a cool frame in the fall, or soft cuttings in propagating-beds during spring. *Campanula Carpatica* in variety, and *C. rotundifolia*, the true Bluebell of Scotland, are well established with us, sowing themselves freely, and needing to be carefully thinned out to prevent their becoming weedy. *Geranium sanguineum*, bright purple, and *G. Endressi*, bright pink, are the hardiest and best of all these kinds to grow, inasmuch as they take care of themselves, and continue well in bloom throughout the summer.

The double *Lychnis vespertina* is a very old-fashioned plant. It is not common, however, being rather hard to propagate. It can best be increased by cuttings, as the root-stock does not bear division. It is very difficult to get anything but flowering stems for cuttings, and these root very slowly and take a long time to make plants. It is, however, a very desirable plant.

The flowers are of the purest white, excellent for bouquets, and last a long time when cut. The habit of the plant is decumbent, fitting it either for the rock-garden or border, and it produces bloom from June until October. I was surprised to find *Erodium Manescavi* survive even a mild winter. It is now nicely in bloom, and will continue through the summer. Though not particularly showy, it is yet the brightest of the genus, and combines with its rosy flowers handsome fern-like foliage. This can be increased easily by seeds or by division of the root-stock.

Genista tinctoria (Woad-wax) is a pretty, dwarf, prostrate, leguminous shrub of great merit, being an ideal rock-plant, and at the same time excellent for cutting purposes. Hardwood cuttings taken in the fall, and wintered in a cool frame, root freely in spring. Thousands could be raised in this way in a comparatively short time, and no plant, it seems to me, would be better for covering sunny banks and planting on natural ledges, where they occur on estates. A companion to this is *G. sagittalis*, a very distinct and showy species, which has phylloidal stems and bract-like appendages, taking the place of leaves, and performing their functions.

Among Sea Pinks (*Armeria Lauchiana*), known also as Crimson Gem and Pink Beauty, is the best. Though old and common plants, they are great favorites everywhere, never being untidy, for when not in bloom their persistent green leaves always look pleasing. *Silene alpestris* has flowered remarkably well this season. A mass with its elegant star-shaped flowers of the purest white is quite striking. *Achillea tomentosa* is one of the few species of this genus which is not weedy. The flower-heads are a good clear yellow, not over one foot tall. The foliage makes a good green carpet. The Alpine Bugloss (*Ajuga alpina*) is a common species, and the most attractive of the genus, having whorled spikes of lovely gentian blue. It should not, however, be planted in a choice position on account of its liability to overrun smaller neighbors. The path leading to our rock garden takes a zigzag turn through the Ghent Azalea bed. This path is lined on either side with *Myosotis palustris semperflorens*. This Forget-me-not is equally at home in sun or shade, and would make an excellent plant for covering the ground in shrubberies did it not so entirely take possession of the soil wherever planted.

Wellesley, Mass.

T. D. H.

Notes and Queries on Hardy Plants.

Inula glandulosa is a plant that has been known to gardens about fifty years and is still as scarce as it is beautiful. There is no reason why this should be so, except, perhaps, that it is not sufficiently known. The plant in question is a Composite with bright orange-yellow flowers three or four inches across on stout erect stems two feet high. The flowers have large discs and numerous narrow ray florets and are very ornamental. There is nothing coarse or weedy about *I. glandulosa* as in the native species *I. Helenium*, and it is just possible that the influence of the latter has been prejudicial to the former amongst cultivators of hardy plants. I recently saw a fine *Inula*, which I think was called *I. grandiflora*, but whether a species or a variety of the above I do not know. As the seed came from Herr Max Leichtlin, perhaps he can tell us more of the plant. Certain it is that it is one of the best novelties I have seen lately, and the plant is most promising, as it is easily raised from seed, has bright orange flowers and is perfectly hardy here in Massachusetts.

And now as to *Delphinium Zalil* (*sulfureum*). Mr. Farquhar, of Boston, tells me he saw it at Erfurt last summer fully five feet high, with much branched stems, covered with beautiful lemon-yellow flowers. If this can be done in Erfurt, why not here? Should the plant be biennial or perennial it certainly would be worth growing. I have seen but one lot of plants, and they were about eighteen inches high when about to bloom and much resembled *D. Chinensis* in habit. My own attempts to raise this *Delphinium* from seed have been failures.

Nor have I succeeded with *Ostrowskya magnifica*, another novelty, the figures of which in English papers raise one's expectations. Nothing is better calculated to cool one's ardor than sowing seed and waiting for plants that never come. It is quite possible that there is no difficulty about obtaining the above plants from seed, if we only knew the conditions necessary, whatever they may be. It appears that good plants of *Ostrowskya magnifica* have thick, exceedingly brittle roots that are often four feet long, so it is obvious, if we are to have them at all, seed is the least difficult way to get them, if it would only germinate.

South Lancaster, Mass.

E. O. Orpet.

Oilcake for Wire-worms.—When pasture land is taken into a garden, there is usually trouble from wire-worms. A Primrose bed at Wisley was much injured by them. A good gardener told me that if bits of oilcake were sunk in the ground, the wire-worms would eat it, and a great gardening authority said that it killed them. My gardener put a number in a box with some cake, but so far they seem none the worse, but it is a most effectual trap. Pieces about the size of a hen's egg sunk three inches in the earth, with a stick to mark the place, and taken up after three or four days, will be found to have wire-worms imbedded in them, eight to twelve to a piece of cake. We have killed many hundreds. Old stagers know the use of oilcake, and gas-lime is said to be effectual, but with plants in the bed this would be dangerous.

George F. Wilson, in *The Garden*.

[Why not poison the oilcake? In this country, where a dough of sweetened corn-meal is used as a bait, it is poisoned; and arsenites sprinkled on fresh leaves of clover or elder and laid about a field or garden under boards have proved effective.—Ed.]

The Forest.

Notes on the Ligneous Vegetation of the Sierra Madre of Nuevo Leon.—I.

THE Andean Mountain system, continued through Central America, forks in the Mexican state of Oaxaca, the principal or longer branch running on northward parallel with the coast of the Pacific Ocean and the Gulf of California, and not far inland, and the shorter though not less elevated branch diverging northward (precisely speaking north by west), and terminating in the scattered mountains of south-western Texas. Within these two giant arms is embraced the high table-land of Mexico. To the loftier summits, the central backbone of both these mountain chains, is applied the name of Sierra Madre, or Mother Range, the flanking ranges and outlying spurs more or less separated from it by inhabited valleys receiving special names. For some two hundred miles of its extent the eastern Sierra Madre chain is included within the state of Nuevo Leon, or forms the boundary between this state and the state of Coahuila on its west.

Several months of the summers of 1888 and 1889 were devoted by me to attempts to explore this Sierra Madre region with base during most of the time at Monterey—Monterey aptly named, the word telling of the kingly mountains which tower round about this quiet city of white, sunny streets and green, shady parks and gardens; to the eastward Sierra de la Silla, or the Saddle Mountain, with its grotesque sky line only four miles away and 4,000 feet above the plane of the city; on the west the Mitre Mountain, terminating in towers and sharp pinnacles of bare rock, quite as lofty and quite as near; while on the south at scarcely less distance are miles of the Sierra Madre stretching east and west even higher, a bare mountain wall of soft, white lime rock, lichen-stained, terminating in a thin comb, on whose crest are seen waving a few scattered Pines and Palms. The northern face of this mountain wall it is not possible for the foot of man to scale, but we pass around it at either end through cañons plowed out in the soft lime rock by the torrents of countless summers—cañons with vertical walls often hundreds of feet high—and mount by these with severe toil to wooded slopes and summits, only to see higher and higher summits beyond and above us, and to find too often our further advance rendered perilous or impossible by a network of forking cañons.

Across this Sierra Madre range the traveler by train of the Mexican National Railroad between Monterey and Saltillo is borne almost as swiftly and gently as though by the enchanted tapestry of the Arabian Nights. Looking backward and away to the south-east as the train mounts the mesas of Garcia and nears the base of the mountains, he sees several successive ranges with serrated summits rising one above the other and receding far away in the soft blue haze. Soon after passing Garcia station, twenty miles west of Monterey, the train enters a labyrinth of

deep cañons. Slowly and laboriously the engine pants in dragging the train up the hard grades. On every hand, as the train winds through the cañons and crosses their rivulets from side to side, arise steep mountains, their brows 1,000 to 2,000 feet above the road. In their configuration, in their formation, and in the vegetation which they bear, these mountains afford a good illustration of the arid mountains which dot or rather line off at intervals the broad northern table-land covered by the states of Chihuahua, Coahuila and Durango, and parts of Zacatecas and San Luis Potosí—limestone of various qualities showing more or less quartz, its strata contorted in the wildest manner, scarcely half concealed beneath a thin covering of soil which is barely sufficient to support a low dingy green growth of Agaves, Cactuses and desert shrubs. Only in rare places where there has been an accumulation of soil, as in cañon pockets and in hollows about the summits, are seen a few clumps of small trees.

Some thirty miles from Garcia and 3,000 feet above that place the train emerges upon the open table-land, and turning southward skirts for a long distance the western base of the Sierra Madre.

Thus we gain some idea of the character of this mountain chain, which stands with its western base resting upon the inland plains 6,000 feet above the sea, and its eastern base upon the lowlands only 1,500 feet in elevation. From central summits 10,000 feet high its western slope descends gradually by comparatively broad ridges and open valleys, while its eastern is steep and everywhere cut by the most terrific cañons. On its eastern slope and along that base fall the rains which come up from the Gulf of Mexico; and living springs and streams abound there, which condition ensures perennial verdure and considerable forest-growths. Its western slope, on the contrary, being left rainless during most of the year, partakes, as we have seen, of the character of the desert mountains of the interior; rarely are springs or brooks to be found there; and forests are mainly confined to the higher and cooler summits, or to those situations which are least exposed to the sun. Furthermore, the floras of the two sides of this Sierra Madre are quite different, not only as respects woody plants, as will be seen, but herbaceous as well.

To mention (though quite incidentally, because the district lies within the state of Coahuila, yet for purpose of comparison) the ligneous species observed on the mountains about Carneros Pass, on the western side, I may begin with *Pinus cembroides*, because this species appeared to be the one most abundant and widely dispersed. As a small tree, seldom more than twelve or fifteen inches in diameter, low-headed by reason of its sparse growth in the shallow dry soil of the region, it occupies the cooler slopes and summits of the foot-hills, coming down within a few hundred feet of the level of the plains.

Pinus latisquama, growing with it, and choosing especially the dry calcareous bluffs of gulches, is a much smaller tree, is less than a foot in diameter and less than twenty feet high. Its long horizontal branches, with long and slender branchlets bearing tufts of bluish green leaves from which hang on long peduncles the solid and heavy cones, give this tree a peculiar appearance among Pines.

Widely distributed, also, and at various elevations, appears *Quercus grisea*, here more than ever a slow-growing, gnarled, contorted tree, its trunk, even its branches, showing hollows and seams.

About the margins of the higher plains and valleys, where these rise by gentle slopes to meet the foot-hills and fill the recesses amongst them, thin forests of *Yucca Treculiana* lend a striking character to the landscape. The stems of this plant, rather less than a foot thick, rise to a height of fifteen to twenty feet, and bear single heads (or at most but few heads on short branches) of numerous sword-shaped leaves about two feet long. The panicle of flowers is three feet in length and erect; but it appears to be rarely produced here.

On the higher summits a third Pine was met with, pre-

sumed to be the tree doubtfully referred by Mr. Watson (Parry & Palmer, 844) to *P. Teocote*. It forms a large tree, similar in appearance to *P. Montezumae*, and yields much good lumber.

The more shaded and cooler slopes of the higher mountains, especially the ravines with northern aspect, which furrow them, bear dark groves and belts of *Pseudotsuga taxifolia*. With this tree, but following the ravines down toward the base of the mountains, is *Cupressus Guadalupeensis*; while *Juniperus flaccida* and *J. tetragona*, var. *oligosperma*, small trees less than a foot in diameter, were found in cañons near their base.

The sunnier and therefore drier slopes of these mountains are covered with a dense growth of shrubs, chiefly Oaks, *Quercus reliculata*, and another, perhaps a new species near *Q. pungens*. In rich cañons the former becomes a tree as elsewhere, and with it are *Q. Emoryi* and *Q. virens*.

The foot-hills are mainly ledges of limestone scantily strewn with soil, and these bear, besides the usual growth of Cactuses, Agaves, etc., a scanty shrubby vegetation composed chiefly of the following species: *Lindleya mespiloides*, in gulches growing to a height of ten to fifteen feet; *Cercocarpus parvifolius*, inferior growths; *Cowania plicata*, a lovely plant when covered with its Rose-like flowers; *Fraxinus Greggii*, with slender stems fifteen feet high and forming thickets; *Arbutus Xalapensis*, in a dwarf state; *Arctostaphylos pungens*, *Microrhamnus ericoides*, *Rhus microphylla*, *Ceanothus Greggii* and *Ephedra aspera*, sometimes six feet high.

Charlotte, Vt.

C. G. Pringle.

Periodical Literature.

Under the title "Lungs for our Great Cities," the Earl of Meath, who has had experience in such matters, as Chairman of the Metropolitan Gardens Association of London, gives, in the *New Review* for May, an account of the impressions he received during a visit to the chief cities of this country. "A veritable rage for park-making," he says, "seems to have seized the American public. The large towns of the United States and Canada are vieing with each other in the establishment of parks and boulevards. Taxation for these purposes is readily submitted to, and enormous sums of money are now being annually voted on this account."

At Chicago, he was told not only that the Park Tax was the one to which no objection was ever made, but also that officials were constantly being asked why more money was not spent on the parks, "as it was the one expenditure of public money which the people thoroughly appreciated, enjoyed and took pride in." But the author says it is only within recent years that the necessity for having breathing spaces in cities has thus been recognized; so, in our older towns, the more densely populated districts are devoid of those frequent small parks, which alone can give the poorest of the poor a daily breath of fresh air and sight of green leaves. It is with great approval, therefore, that he notes the recent passage by the Legislature of an act for the incorporation and improvement of additional parks in the City of New York, and the appropriation for the purpose of \$10,000,000, to be expended in ten years. We wish we could feel as confident as he seems to feel that within this time the whole sum will indeed be spent in pulling down tenement houses, and purchasing sites for numerous small playgrounds. The park areas of many towns, from Boston to San Francisco, are passed in review by Lord Meath, with few words of criticism and many of high approval. Druid Park, in Baltimore, he calls "in some particulars the finest park among those I visited—a lovely specimen of the forest park." Fairmount Park, with the ravine along the Wissahickon River, he says is second in size among the public pleasure grounds of the world, to Epping Forest, near London, only, and, "perhaps, in its particular type of beauty, is second to none." He speaks of the Central Park as extremely artificial, but adds, "notwithstanding this excessive artificiality, Central Park remains one of the most beautiful of gardenesque places. I know nothing prettier of its kind than the view I saw on an October day, standing on the 'terrace,' at the end of the 'mall,' in the Central Park, looking across the artificial lake to the opposite shore, blazing in the glorious colors of American autumn foliage. The finest natural parks, as opposed to artificially-made grounds, in the United States, are, perhaps, those of Druid Hill, Baltimore; Fairmount Park, Philadelphia; Prospect Park, Brooklyn; and Forest Hill, St.

Louis; whilst among the artificial parks, Central Park, New York; and Lincoln and South Parks, Chicago, may be said to rank highest. These two cities have both had to manufacture recreation grounds out of the most unpromising materials. They have had to transport for long distances the actual soil of which their parks are composed, and have had to plant every single tree, shrub and flower within their limits, and make every rise and depression of the ground. These gardens are, consequently, entirely different in style from those magnificent parks which owe their beauty and picturesqueness to nature, and they must be viewed with a different eye, and be judged by a different standard." There is some mistake as regards the Central Park in this description of the difficulties which attended its making. With the exception of two or three ancient Oaks and Willows, there are, indeed, no trees in its lower portion which were not planted, but in the northerly portions there are many of native growth; and here, instead of making rises and depressions in the ground, the landscape-gardener's task was to level some of those which already existed in too great numbers, in order that certain broad, quiet, practically level stretches might be secured. But this means, of course, that the task was even more difficult than the English critic suggests. Again, in distinguishing some of our parks as natural, and others as artificial, Lord Meath does not use the terms exactly as a landscape-gardener would use them. The Central Park, with the exception of one or two features, like the Mall, is distinctly in the naturalistic, not the artificial style. In certain parts, as in the ravine toward the northern end, where the Rhododendrons grow in masses, it looks as though man had done no more than lay out the needful roads, while in other parts, like the sheep-meadow, which was actually formed by blasting out surface irregularities, it looks as though he had merely refined upon and carefully tended a spot which nature had created much in its present shape. What the author really means by the contrast he draws is that some of our parks look wild and others cultivated—some look like untouched natural scenes, and others like natural parks in the technical acceptance of the term.

But, throughout the article, Lord Meath shows that his concern with parks is practical, rather than artistic. He thinks, or, at least, speaks little of their design and much of their position and the facilities they offer for the recreation of the people. In many directions, he finds them better adapted to this end than English parks. Incidentally, indeed, he says that he hopes the wildness of the new parks in our "annexed districts," as compared with the "artificiality"—that is, the true park-like character—of the Central Park, "will, perhaps, encourage New Yorkers to give a little more latitude and freedom to the citizens in the use of their parks." But he may not have remembered, in contrasting London customs with ours, that the greater heat and dryness of our summers render it imperative to limit access to the meadows, if the grass is to be preserved at all; and he does full justice to the facilities afforded for sports in various parts of the Central Park. As he seems to have been here in the autumn, he doubtless missed one of the most delightful scenes that this park offers—a Saturday afternoon in June, when all the greens are freely given over to the school children, and they swarm in thousands everywhere.

In general, Lord Meath speaks with unstinted praise of the way in which American parks are made useful to the people, as well as pleasant in their eyes. From this point of view—as true recreation grounds—he finds in them many arrangements that might advantageously be imitated in England. In London, he says, there is no zoological garden freely open to the public; the small parks are not lighted so that they can be used in the evenings; the children have no swings, merry-go-rounds and goat-carts; nor do our conservatories, our music-galleries and our numerous facilities for athletic sports find a parallel there. Even the "Lohengrin boats," which many of us think grotesque, rather than ornamental, come in for a share of his generously-bestowed praise. The provisions for athletic sports in the Charles River Embankment Park, in Boston, are described at length, and with the highest approval. Moreover, the way in which our parks are managed by small boards of commissioners, "independent and comparatively permanent," he finds much better than the English plan of a large council elected by a popular vote which, in London, cannot undertake "any expenditure exceeding the sum of £50 without a vote and discussion in full council of 137 members." It is cheering to get a word of praise for any municipal arrangement in this city, which we have come to consider as by no means the best governed in the world! The power our Park Commissioners possess to control the

thoroughfares, and, in some cases, the building sites in the neighborhood of the parks, is likewise commended. The object of Lord Meath in making the extensive journey whose results he here describes was "not to criticise and find fault, but, if possible, to learn, with a view to the improvement of the London parks," at that time under his charge. Undoubtedly, had his aim been different, he could have found many details to criticise; but it will be a surprise, we think, to most Americans to learn how many things he found, from his own point of view, that were worthy of imitation. In some ways, Americans are conceited enough; but as regards all matters of municipal administration they are very apt to think that "they order these things better in France," and in every other part of Europe, too. Many travelers, seeing the free way in which Londoners are allowed to walk on the grass in their parks, come home to say that the pleasure of the people is better considered there than here. Nothing could be more useful in opening their eyes to the real facts of the case than this clear and comprehensive article of Lord Meath's. Nor will it fail to surprise many by its mere enumeration of the number and extent of American parks, and its account of the zeal and discretion with which they are being enlarged and improved.

Correspondence.

Hardiness of Indian Azaleas.

To the Editor of GARDEN AND FOREST:

Sir.—Your note on the Indian Azaleas in Central Park reminds me that I had a fine plant of the variety known as Alba, and grew it for years with no suspicion that it was hardy until ten or fifteen years ago I discovered it by accident. My plant stands by the porch on the east side of the house, and during the ten or twelve years since it has been there it has failed to flower but once, and then a cold wave late in the spring swept down upon us and killed the buds, just as the March weather killed all the Peach-buds this year. My plant is of oblong shape and nearly five feet through the longest way. It was covered with bloom this spring, and judging from the exclamation of the occupants of the hundreds of carriages which passed by, it must have seemed to them, as it certainly did to me, a strikingly beautiful object.

Montclair, N. J.

E. Williams.

Forestry and Irrigation.

To the Editor of GARDEN AND FOREST:

Sir.—The reason that more attention has not been given to the articles on Institutions for the Arid Lands, in the *Century Magazine*, is partly in the fantastic element in them, the quality of unreality, as in the passage which affirms, regarding the people of those regions, that "on this round globe, and in all the centuries of human history, there has never before been such a people. Their love of liberty is unbounded, their obedience to law unparalleled, and their reverence for justice profound; every man is a freeman king with power to rule himself, and they may be trusted with their own interests." It is encouraging to hear of the superior civilization of our fellow-citizens of the far west. I have long been aware of their many good qualities, but had not known before that absolutely no other people equaled them in obedience to law. It seems queer that among such people there should be "a bitter, relentless war, disastrous to both parties," between capital and labor, and that many farming corporations and water corporations have been almost destroyed by unfriendly legislation and by judicial decision, as we are informed a little farther on in the same article. The information that "when the physical powers of nature are employed, and human powers engaged in their control, men cannot be enslaved; they assert their liberty and despotism falls," is curious, and if true may be important. Is there any evidence in all Major Powell's writings that he has ever studied forestry subjects? Did he not rather begin by inventing theories of his own which have no basis in the observation and comparison of phenomena? The indifference to the facts upon which forestry is founded is palpable in all his later writings that I have seen. And as to feeling, a man with much feeling for trees would not set fire to a grand forest, or even to one noble tree, and then constantly tell of it with so much zest. Whatever may be the reason, Major Powell's voice has not been heard in recent years in aid or encouragement of the friends of the forests, but in opposition to their efforts.

Washington, D. C.

L. W.

Notes.

Remarkably fine Nectarines from Jobstown, New Jersey, have been selling in this city at from four to six dollars a dozen.

Local journals state that Pecan-nuts have recently come for the first time into the markets of Vienna. They were called by their introducers "Indian nuts," but, their origin being unknown to the public, the term has quickly become corrupted into "India nuts."

Within the past ten years the park area of this city has increased from 1,094 to 5,000 acres. Of course, most of the increase is included in the so-called "annexed district," where the parks, although containing beautiful passages of natural scenery, have not yet been definitely treated by the landscape-gardener.

The large Japanese Lilac, *Syringa Japonica*, never flowered as well as it has this year, which seems to indicate that the tree will improve in its flowering qualities as it grows older. The creamy white inflorescence is so large that it makes a good show at a distance above the deep green leaves, and this fact also adds to its value.

According to the *Revue Horticole* the best new Rose of the year which has appeared in Paris is the variety on which has been bestowed the somewhat cumbersome name of La France de 1889. It is a seedling from La France with flowers equal in size to those of Paul Neyron. The color of the flowers is described as a soft rose-magenta, and they reach even on the young plants a diameter of six inches.

In our London letter, on another page, Mr. Watson has a good word for the Foxglove as a garden plant in England. It is strange that this flower is not more generally used in American gardens. Nothing can be more effective than the tall spikes of the Foxglove at a little distance when scattered singly or in small groups with a background of shrubbery or dark foliage. A close inspection, too, will show that the individual flowers are not only beautiful in form, but exquisitely delicate in their color markings.

The "bent wood" furniture exported in such quantities from Austria is manufactured from the wood of the Beech, which, after being sawed into long strips, is turned into round rods. These, on exposure to the action of superheated steam in an air-tight case, become so pliable that they can be bent by hand to the iron patterns. The drying occupies several days, after which but little labor is needed to combine the pieces into articles of furniture. Almost the only rocking-chairs one ever sees in Europe are made of this "bent wood."

No Azalea is more beautiful than *Rhododendron (Azalea) arborescens*, which is at home along the smaller streams among the foot-hills of the North Carolina mountains, and which has been figured already in this journal (i. 140, fig. 64). The pure white flowers are not viscid like those of our Swamp Honeysuckle (*R. viscosum*), and the bright scarlet stamens and pistil add much to their attractiveness. Their fragrance, too, is delightful, and the leaves when drying exhale the perfume of new-mown hay. The plant comes into bloom later than other Azaleas, and this year the flowers in the neighborhood of this city lasted until the 4th of July.

The principal illustration of the *Revue Horticole* of the 16th of June is devoted to a group of single Chrysanthemums to the beauty of which Monsieur André calls especial attention. These charming flowers, which possess ornamental qualities of the highest class, have been very much neglected in this country in the rage for the double-flowered varieties which have become so fashionable of late years. A single Chrysanthemum flower cannot, of course, be compared in any way with one of the great double flowers. They are very beautiful, however, and add so much to the variety of a collection that it is surprising they are not more frequently cultivated.

We have more than once spoken of *Fraxinella (Dictamnus Fraxinella)* as an old-fashioned garden plant, now almost forgotten, which should again become popular on account of the delicious fragrance of its flowers and their property of emitting a volatile oil in such quantities that it may sometimes be ignited by a match even if held at a little distance. The *Illustrirte Garten Zeitung*, of Vienna, recently called attention to the same facts, saying that the plant had actually been regarded by some in former times as the "burning bush" of Moses. It grows wild in the Austrian Alps, where in rocky woodland nooks it attains a height of more than three feet; and the writer in question takes it as a text to plead the cause of the many indigenous plants which, it seems, in Europe as well as in America, are ignored in favor of foreigners no whit more beautiful than they.

According to a note in the June issue of the *Revue de l'Horticulture Belge et Etrangère*, there is in the gardens of the palace at Versailles an Orange-tree more than 450 years old. It is said to have been the first introduced into France, and is known as the "Grand Connétable." The seeds from which it grew were sown at Pampelune about 1416 by Eléonor of Castile, wife of Charles the Third, King in Navarre. Later the tree was brought to Chantilly, then to Fontainebleau, and finally, in 1684, was added to the collection of Versailles. The handsomest Orange-trees, grown in tubs in France, are those in this collection and in those of the gardens of the Tuileries, and of the Luxembourg Palace in Paris. The gardens of the Palace of Compiègne still contain fifty large specimens, brought there during the reign of Napoleon I. There are also collections of these curious old Orange-trees supposed to be several centuries old in a number of private gardens belonging to various French chateaus. They are always carefully tended, and produce year after year surprising crops of flowers and a good deal of fruit, considering how long their roots have been cramped within narrow quarters.

Mr. Barr Ferree, writing in the *American Architect and Building News*, describes an interesting bit of Aztec construction, the dome of a building called the Sondorhuasi, at Azangaro, in Peru. An ancient Spanish historian, writing of such roofs, says they "are of straw, but so artfully laid on that, unless destroyed by fire, they will last many ages." This verdict is certainly justified by the roof in question, which is still in good condition, although known to have stood for more than 300 years. It "is formed of Bamboos of equal size and taper, the larger end resting on the top of the walls. They are bent to a central point over a series of graduated hoops also of Bamboo. At the points of intersection the vertical and horizontal Bamboos are bound by fine cords of delicately braided grass. On this skeleton is a fine mat of the braided epidermis of Bamboo or rattan without seams, which may have been braided in position. It is worked in colors and panels conforming with the spaces between the framework, which is itself painted. An open and coarse matting fastened with a fleece of finest ichu, depending like a heavy fringe outside the walls, is placed over this. Then comes a transverse layer of coarse grass or reeds, then ichu and so on, the whole forming a slightly flattened cone. The projecting ends of the ichu layers were cut off sharply and regularly, producing the effect of overlapping tiles."

The answer recently given in the Boston *Transcript* to a correspondent who had asked, "What are the legal rights of owners of trees abutting streets and sidewalks?" may be of interest to others, as there is a general belief that these rights are narrower than is actually the case. According to the *Transcript*, in the state of Massachusetts at least, "a street is simply a strip of land set aside for the common good—a highway over which every one has a right to pass. But the public does not own it; it has simply the right of way over it. The fee usually belongs to the owners of the abutting land, who have a right to make any use of the land within the limits of the street which does not interfere with the public's right of way; for instance, the owner of the fee may cut the grass growing by the roadside, gather the fruit growing upon trees within the limits of the highway—the trees are his property. For public convenience towns and cities are required to keep all public highways within their limits in a condition that shall insure the safety and convenience of people lawfully traveling thereon. Cities and towns have no further rights or authority in the streets and highways than simply to discharge the duty imposed upon them by law to make and keep in repair the surface of the street and to remove anything which obstructs travel or renders it unsafe." A passage from the public statutes is then cited which declares that municipal officers may grant permission to retain or to plant trees on the highways in proper positions, that they shall be considered the private property of those who plant them, but that if complained of and proved to be nuisances their removal at the owner's expense may be ordered. In 1867 a suit was brought against a superintendent of streets in Bristol County for allowing the branches of a tree on the highway abutting the plaintiff's land to be cut to permit the moving of an engine-house. The verdict was given for the plaintiff, and the Court remarked, "This enactment has limited in an important manner the powers of highway surveyors. Shade trees are no longer liable to be treated as a nuisance and lopped or cut down at the discretion of every such officer. They are private property, to the ornament and shelter of which the owner of an adjacent estate is entitled, and they cannot be interfered with except upon due process of law, as marked out in the statute."

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Can the Nation Protect Its Own Property ?

A FORTNIGHT ago the Senate of the United States, in Committee of the Whole, was considering a bill which provides that "any person who shall maliciously or negligently and carelessly set on fire any woods, underbrush or prairie on any of the public lands of the United States, or who shall suffer any fire, which he may have lighted on other lands, to pass therefrom to the public lands of the United States, shall be deemed guilty of a misdemeanor, and, upon conviction thereof in any District Court of the United States having jurisdiction of the same, shall be fined in a sum not more than three times the value of the trees or other growth so destroyed or injured, or imprisoned for a term not more than three years, or both."

The occasion for framing this measure, as reported by the Committee on Agriculture and Forestry, was found in a message of the President transmitting a letter from the Secretary of the Interior. In this letter it was stated among other things that a fire was started by the Sheriff of Boise County, Idaho, and certain well known citizens with him, which destroyed a large amount of timber belonging to the Government. In accordance with a special agent's report setting forth these facts, it was recommended by the Secretary of the Interior that the United States District Attorney should institute criminal proceedings against the men who kindled the fire. The United States District Attorney returned the papers in the case with an opinion that there was no way of reaching the perpetrators of this act under the United States statute. It was in view of this that the bill was drawn up by the Commissioner of Public Lands and endorsed by the Secretary of the Interior, for without such legislation it would seem that fires may be kindled deliberately to the destruction of any quantity of Government timber, not to speak of the destruction of human life which often happens in such cases, while the Government is powerless to punish any one for this crime, and that, too, in spite of the fact that in response to an appeal from the Governor of this very territory of Idaho, the United States Government had expended a large amount of money in fighting these forest-fires, in order to protect its citizens from personal loss.

And now when this bill, which seems so fair and just, was before the Senate, Mr. Teller, of Colorado, objected to it (and the bill was laid over in accordance with this objection) on the ground that the Government of the United States cannot create any offense in the state of Colorado or in any other state except on those lands where they have exclusive jurisdiction. That is, the United States Government has no authority to say what shall be larceny or what shall be a misdemeanor on the public lands in the state of Colorado. It has no right to make it a criminal offense to burn timber in the state of Colorado, for the relation of the Government to its timber in that state and to its land is the same as that of any other proprietor. Now if Senator Teller's position is correct—that is, if the United States Government has no power to legislate against offenses committed in the states against its property—it is pretty clear that some comprehensive forest-policy should be inaugurated so that the Government property can be guarded by a sufficient number of watchmen. If the United States has no power to punish incendiaries who burn over its timberland, it would seem to be folly to wait longer before some thoroughly organized administration of the forest-lands, with state co-operation if necessary, is attempted. It does seem, however, that the United States ought to be able to devise methods for protecting its own property even among the God-fearing and law-abiding freemen who inhabit our western states.

The Silk Cotton-Tree.

THE traveler from the north, landing at Nassau, the principal town in the Bahama group of islands, will, if it happens to be his first introduction to the tropics, be most delighted certainly with the beauty of the Cocoanut Palms, with their tall, straight stems crowned with the great tufts of graceful leaves which sway backward and forward with the slightest play of the wind. But next to the Palms, the great tree, of which a portrait is published on page 347, will, if he has any interest at all in the products of Nature, excite his astonishment and curiosity more than anything else on these islands. It is a fine specimen of the Silk Cotton-tree of the West Indies, which botanists call *Eriodendron anfractuosum*. The generic name is formed from two Greek words meaning wool and tree, and was given to it on account of the brown woolly substance which surrounds the seeds, while the specific name, which means the bending in and out of a road or path, was bestowed upon the tree on account of its great size, which made it easier to divert a road round the trunk than to cut down the tree.

The specimen whose portrait we publish stands just in front of the town-house of Nassau, where it was planted probably in the early days of the settlement of the island, as the branches have attained a spread of 150 feet, while a man walking round the buttresses which support the trunk, and which are well shown in our illustration, must make fifty paces.

The Silk Cotton-tree is the largest inhabitant of the Caribbean forests. Few trees have a loftier and more imposing appearance; as it overtops its companions in the forest, or appears in solitary grandeur on some open plain or by some cultivated field, with its stout trunk strengthened in old age with numerous buttresses, and dividing sometimes near the ground into enormous spreading branches, and sometimes shooting up into a great column sixty or eighty feet high. The branches and the trunk of young plants are armed with straight acuminate spines. The ample glabrous leaves are palmately divided into six or seven oblong-lanceolate leaflets. The flowers, with their persistent calyx and five reflexed pale rose-colored petals, joined with each other, and with the three-branched column formed by the united filaments, are produced in the greatest profusion, and possess the delicate fragrance of primroses. The fruit is a large, woody, round, obtuse capsule, consisting of five cells, and splitting open by five valves, each cell containing a number of

broad seeds surrounded by dark brown cotton similar in character to that of the Cotton-plant, which botanically is nearly related to this tree.

The Silk Cotton-tree grows very rapidly, and the branches, like those of the Gumbo Limbo, another West Indian tree, which is common also on the islands of south Florida, have the power when cut and set in the ground of developing roots and growing rapidly into large trees. This makes it an easy plant to propagate, and it is frequently planted as a shade or road-side tree, not only in the West Indies, but in all other tropical parts of the world. The great size of the trunks, their lightness, and the ease with which the wood can be cut, enabled the Caribs to make from the Ceiba, as they called this tree, their great war canoes, in which they traveled safely over wide distances of open sea. The young leaves are mucilaginous, and are sometimes used by negroes as a substitute for the okra, which is the fruit of another plant of the same alliance; and the cotton which surrounds the seeds, although the fibre does not permit of its being woven into cloth, is sometimes used in stuffing furniture.

The imposing size and great beauty of this tree, and possibly the belief that the woolly appendage of the seed might prove of greater value than it has turned out to be, attracted the attention and excited the wonder of travelers in the early days of the discovery of the new world. Oviedo y Valdes, who landed in San Domingo in 1514 and wrote the earliest account of the natural history of America, was the first author to mention it, and from Oviedo's day to the present the Silk Cotton-tree has been described more or less in detail by every author who has written of the natural features and productions of the West Indies and the Spanish main.

Eriodendron belongs to the tribe of the *Bombaceæ* of the Mallow family, of which several other remarkable plants are members. It contains some of the largest trees. The African Baobab, the *Adansonia* of botanists, its near ally, is one of the marvels of the vegetable kingdom. The trunk of this tree sometimes attains a circumference of a hundred feet, and individuals were estimated once to have lived through six centuries. Later investigations, however, do not sustain such theories, as the Baobab is now known to grow like the other trees of its family with great rapidity. It is a native of the Cape de Verd Islands and other parts of west tropical Africa, where the negroes regard it with superstitious veneration, rendering it sacred by attaching bracelets to the trunk and branches in the hope of securing it from injury at the hands of the profane. The thin bark, which covers trunk and branches, is green, and appears to perform, to a certain extent, the functions of leaves, which only remain on the branches during three or four months of the year. It is the pulp that surrounds the seeds of this tree which is believed to have furnished the *Terra lemnia*, the mysterious powder brought to Egypt by the caravans and held in high repute by the physicians of the ancients for the treatment of many diseases. Another species of *Adansonia* inhabits Madagascar, and a third is Australian.

To the *Bombaceæ*, too, belongs the Durio (*Durio zibethinus*), a large tree of the Indian Archipelago which furnished the Durien fruit, one of the most delicate and esteemed of all tropical fruits, although it possesses an odor which is unspeakably offensive to people when they first smell it, but which is unnoticed when once the taste for it is fairly acquired. This fruit forms a large part of the food of the native population in some regions of the East Indies, and as the trees are always left standing when the forests are cleared off for cultivation, the Durio is one of the conspicuous features in many eastern tropical landscapes. It is cultivated all over the east for the fruit, while the wood, like that of another plant of the same relationship, the Asiatic Bombax, has many useful qualities.

We are indebted to Mr. William B. Bacon, of Boston, for the photograph of the great Silk Cotton-tree at Nassau, from which our illustration has been made.

The Economic Uses of Leaves.

EVERY part of plants and trees is more or less utilized by savage and civilized men—the roots, stems, sap, bark, fruit and seeds, and leaves. If we take the foliage, apparently the most insignificant part of the plant, how dependent are we on these for food, clothing, medicine, dyes, stains and various comforts. In tropical countries especially the domestic uses of leaves are almost innumerable.

The leaves of many Palms are largely employed for making hats. Those best known are Panama hats, made from the finely-plaited fibre of the leaves of a South American Screw Pine (*Carludovica palmata*). The tree occurs only on the slopes of the Andes. About 200,000 dozens of these hats are made in Ecuador and different states of South America, and they are distinguished from all others by consisting only of a single piece and by their lightness and flexibility; they may be rolled up and put in the pocket without injury. The plaiting of the hats is very tedious and troublesome; the coarse ones may be finished in two or three days, but the fine ones take as many months to plait. They vary in price, according to fineness and quality, from five dollars to a hundred dollars. The unexpanded fronds of *Livistonia australis*, prepared by being immersed in boiling water, are dried, and the fibre thus obtained is much valued for the manufacture of hats in Australia which much resemble the celebrated Panama hats.

The rough leaves of the Chumico (*Curatella Americana*) and of *Davilla lucida* are used for cleaning iron and polishing and scouring wood. *Curatella alata* is used in the West Indies for polishing bows, sabres, etc.; and in Brazil *C. sambaiba* serves all the purposes of sand-paper to the Indians for polishing their blow-pipes and war clubs. The leaves of *Celtis orientalis* are used for polishing horns in the East Indies.

The foliage of *Guaiacum officinale* is very deterrent, and is frequently used in the West Indies to scour and whiten floors, which it is said to do better than soap.

Leaves sewn together are much used in India as substitutes for the plates and dishes of more civilized life. It is not always poverty that leads natives to use them in preference to metal or porcelain articles, as caste or custom has often some influence in the matter. The leaves principally used are those of the Egyptian Lotus; those of the Banyan by Brahmins, and the Plantain-leaf.

The leaves of *Bauhinia Vahlia* are used in the construction of the curious, rude leaf-bellows in Sikkim, with which the natives of the hills smelt iron. These leaves, when sown together, are used as plates, cups, rough table cloths, rain-hats and caps. The leaves are heart-shaped and above a foot in breadth, and the same in length. Sewn together with twigs, they also serve for baskets for holding pepper, turmeric and ginger, and are likewise used for thatching.

Under the name of "Chattahs," a kind of umbrella-hat or sun-shade is made in the East of the leaves of the *Licuala peltata* and the Talipot Palm. These Chattah hats are much worn by the plowmen and coolies of Bengal and Assam.

The large fan-shaped leaves of the Talipot Palm are like those of the Palmyra Palm, carried over the heads of people of rank as an umbrella, and are also used for making books and for various domestic purposes. They are also cut up into neat bracelets, worn by Santal girls in India. Those of *Vanda Roxburghii*, split, are also worn by them as anklets. Those of another species, *Borassus Ethiopicus*, occur as much as twelve feet across, and serve also for the manufacture of baskets, mats, ropes and sieves. The leaves of *Nipa fruticans* attain a height of fifteen to twenty feet, presenting a very handsome appearance, resembling the fronds of huge Ferns. This graceful eastern Palm is utilized in various ways, the principal being in the manufacture of thatching for house-roofs. This manufacture is quite an industry of itself, and affords employment to many natives, chiefly women, the men simply bringing cargoes of the fronds to the women, to be stitched with split rattans, and made up. Atap roofs are the best adapted for these climates, for while the winds are never strong enough to blow them away, they afford the coolest protection against the sun of any kind of roofing known.

The leaves of the Palmyra Palm were formerly used like paper, to write books on, and to this day they are applied to this purpose in Orissa, southern India, and Ceylon, where an iron style is employed to write upon them; in Bengal young children use them to write the alphabet lessons on. They are largely employed for making pans, bags, winnows, hats, umbrellas, and for thatching, etc. The leaf takes a dye well and is worked up in Madras into pretty colored patterns in baskets and mats.

The slips of Talipot and other Palm leaves are coming into European commerce for the manufacture of ornamental

braids, and in the construction of straw or Leghorn hats. The fibre obtained from the base of the leaves of the Chusan Palm is used by the Chinese for making hats and coarse clothing. The sale of Palm leaves for decorative purposes in the towns of Elche and Alicante, in Spain, produces a considerable income to the towns.

Kadjan mats, manufactured out of Nipa leaves, are indispensable for traveling purposes; packed up in the smallest compass when not required, each mat is capable of affording sufficient cover at night for two or three persons, either in boat or forest-journeys. They also form, almost exclusively, the material for side-walls and divisions in houses. The young leaf unfolded and dried, under the name of Roko, forms the favorite covering for cigarettes in the Malayan Peninsula in preference to paper.

The large leaves of the Teak-tree are used for plates, for packing, and for thatching. The leaves of *Cordia myxa* are employed as plates in Pegu, and to cover Burmese cheroots. In Bangalore the leaves of *Canna Indica* are used by the natives in lieu of plates, to serve their Millet puddings and other dishes on.

The leaves of the Papaw-tree are employed by the negroes in washing linen, as a substitute for soap. They have also the property of rendering meat wrapped in them tender, owing to the alkaloid papain which they contain, and which acts as a solvent.

For cordage and other textile purposes, numberless leaves are used, and they serve very generally for packing and wrapping up small parcels in India.

In Guiana, Tibusiri fibre is obtained from the inner surface of the spiral leaves of the Ita Palm (*Mauritia flexuosa*); it is used by the Indians for making hammocks, etc. The leaves are cut before they are open, and the midrib separated by drawing each division of the leaf through the finger and thumb. After drying, the fibre is ready for use without further preparation. About a quarter of a pound may be procured from each leaf, and if the central leaf is left uninjured, no evil effect is produced on the tree. Bags or matting could be cheaply and easily made from this fibre, as well as hats similar to those known as Panama.—*Gardeners' Monthly*.

Cooking Quamash.

WHILE camped at Deer Park, on the Lower Arrow Lake (an expansion of the Columbia River), a week since, I had an opportunity of witnessing the Indian mode of cooking *Camassia esculenta*. This species of *Camassia* is very abundant along the Columbia River, between the Upper and Lower Arrow Lakes, flowering there during the first weeks of May. The bulbs were collected by the Indians before the seed was fully matured, at which time they consider them at their best. The party I speak of had between twenty and twenty-five bushels of them at the lowest estimate. For two or three days before cooking was begun, the women of the party were engaged in cutting and carrying to camp branches of the Alder and Maple (*Alnus rubra* and *Acer glabrum*). Several bundles of the broad leaves of *Lysichiton Kamtschaticense* (Skunk-cabbage), and two or three of *Alectoria jubata*, the black hair-like lichen that grows in profusion on *Larix occidentalis*, had been brought with them.

Everything being ready, the men of the party cut down a huge Pine for no other object, apparently, than to obtain its smaller branches, as no other portion of it was used. A hole about ten feet square and two deep was then dug in a gravelly bank near the lake-shore, which was filled with broken Pine branches. Upon these were piled several cords of dry cedar and pine, and this was covered over with small bowlders. The pile was then lighted in several places, and left for some hours to take care of itself. When the Indians returned to it the stones lay glowing among a mass of embers. The few unburnt pieces of wood which remained near the edges were raked away, and the women with wooden spades banked up the sides of the pile with sand, throwing enough of it over the stones to fill up every little crevice through which a tongue of flame might be thrust up from the coals that still burned beneath the stones. Then the whole was covered with the Maple and Alder boughs to the depth of a foot or more after they had been well tramped down. Over these were placed the wide leaves of the Skunk-cabbage until every cranny was closed. Sheets of Tamarac-bark were then spread over the steaming green mass, and upon these the bulbs were placed. About half of them were in bark baskets closed at the mouth, and each holding about a bushel and a half. These were carried to the centre of the pile. The lichen of which I have spoken was then laid over the unoccupied bark, having been

well washed first, and over it were strewn the bulbs that remained. The whole was then covered with boughs and leaves as before and roofed with sheets of bark. Upon this three or four inches of sand was thrown, and over all was heaped the material for another fire, larger even than the first one. When this was lighted the sun was just setting, and it continued to burn all night.

The next morning our camp was moved away, and I was unable to see the results of the day's labor. I was told, however, by one of the Indians who could speak a little English, that their oven would be allowed a day in which to cool, and that when opened the bulbs in the baskets would have "dissolved to flour," from which bread could be made, while those mixed with the lichen would have united with it to form a solid substance resembling black plug tobacco in color and consistency, which could be broken up and kept sweet for a long time.

Sproat, E. C.

James M. Macoun.

An Experience with Rosebugs.

THE Rosebug, or, more correctly, Rose-chaffer, was known as a difficult subject to Harris and Fitch and the entomologists of their day. They gave us a fair life history of the insect, to which Dr. Riley has quite recently added a good description of the larva, with figures, as well as some further biological notes. Each of these authors seems to have been fully aware of the difficulty of dealing with the insect, and the recommendations as to remedies are vague and unsatisfactory. Fitch gives an excellent description of the way in which the invading swarms cover everything, apples and other fruits becoming so covered that a mere mass of yellow sprawling beetles indicates that here probably is a fruit!

Southern New Jersey has been invaded for several years past by swarms of this pest, which cleared out the grape crops so completely year after year, that many vineyards have been taken out and others will be abandoned unless some practical remedy is found. With the view of testing the value of the published methods I spent some days in the invaded districts. I found that, as a rule, the insects did not breed in cultivated land, but that on the other hand the entire sand region is a vast breeding ground, pupæ being found even at the very sea-shore. From these breeding places the insects emerge and fly about, searching for food, the winds apparently influencing their direction to some extent. Vineyards are therefore generally invaded from the edges, newly arriving hordes ever advancing further. They are not at all dainty in food habits, but do show some preferences. Sumach is readily eaten; Apples and Cherries are tidbits; Sour Gum attracts them by the million; Hollyhocks are eaten, stems and all; Roses are high favorites, while the Peach is not so much liked. In fact, there is scarcely a plant they will not eat, though flowers and some fruits are always preferred. A field of Blackberries at Colonel Pearson's place was swarming with them, and the Colonel told me that last year his Strawberry patch looked yellow where red ought to have been seen.

Pyrethrum has been highly recommended for these insects. I tried it first at the rate of one ounce to one gallon of water. It acted in about ten minutes, the majority of beetles tumbling from the Blackberry-bushes to the ground. Only a few, however, were really stupefied, and most of them began crawling back upon the plants immediately, where, as soon as the sun dried them, they fed as freely as before. Then I increased the dose to one-fourth of a pound to a gallon of water. The effect was more prompt, the resulting stupor more lasting, but half an hour later all were again feeding on blossoms that were yellow with pyrethrum! The insects will live for an hour or two in the pure powder, and recover when removed from it. Tobacco seems to give an added relish to the plants upon which it is applied. Sprayed on at the rate of a pound to the gallon, the powder being added to the decoction, the beetles never stopped eating. London Purple applied as strong as the grape would bear did not prevent the destruction of the blossoms, but left a sprinkling of dead beetles on the ground. Powdered naphthaline, pure, and mixed with carbonate of lime, was dusted over a row of vines with the most approved appliance, so as to leave the vines white. This had not the slightest effect, so far as the blossoms are concerned, and the leaves were eaten from below instead of from above. Carbonated lime was equally ineffective, as was also the pure hydrate of lime, which is better than air-slaked lime, as a rule. Hellebore applied pure is utterly ineffective. Mrs. Treat showed me some Foxgloves in her garden, each plant surrounded by dead Rosebugs. Colonel Pearson thereupon made an infusion of leaves, which was ineffective, while I fed a lot of the beetles for a week upon Roses which were

soaked in a saturated solution of digitaline! Quassia is useless, and so were all the copper compounds, the saturated solution of lime, the iron solutions, the kerosene emulsion; and, in fact, everything else that was applied. All this goes to show what a tough subject we have to deal with. Corrosive sublimate will kill him readily, but, unfortunately, kills the plants as well. A sludge-oil soap, obtained too late to test thoroughly, kills the beetles without injuring plants. It is probable that in this we have a good remedy for the *Macro-dactylus* if it can be made cheaply enough.

Of the mechanical means tried, an umbrella with a sack attached into which the beetles were jarred proved satisfactory, and this can be used at all times of the day, since the beetles cannot fly out of a sack as they could off a sheet or from the ground.

My conclusions are that the only way to save a crop of grapes is to plant *Spiræa*, *Roses* or *Blackberries* between some rows of the vineyard and by persistent collecting keep these plants free and attractive. How persistent one must be is shown by the fact that though Colonel Pearson one year went over his vineyard once a day killing beetles, yet they destroyed his grapes almost completely. This year, though, he daily cleared his *Rose* bushes by applying the sludge-oil soap, yet every bud was eaten.

The *Clintons* many of them bloom and set before the *Rose-bug* arrives in force; they are then generally safe, since the beetles prefer the foliage to the grape. The *Concord* buds are just right for the insects and they go completely. The *Concord* foliage is not relished and only the upper surface is eaten. Very late blooming varieties are also fairly safe, and this indicates another method of dealing with this pest—i. e., plant very early or very late blooming varieties while supplying something for the insects to eat. I may say that the suggestion that *Spiræa* be planted as an attraction is Mr. Fuller's, and that he reports that he saves his grapes in this way.

There is one glimmer of hope ahead! Indications of a decrease in the number of the insects are observed, and natural means may end the invasion. Some eighteen or twenty years ago there was a similar invasion, lasting four or five years. The present flood began about four years ago, and in some places is undoubtedly on the decrease. Colonel Pearson did not suffer nearly as much this season as he did last season, and others have made the same statement.

Rutgers College.

John B. Smith.

Notes on North American Trees.—XIX.

Description of the Wood of Certain Species.

Acacia Farnesiana. Wood very hard and heavy, close-grained, containing many evenly distributed open ducts; layers of annual growth hardly distinguishable; medullary rays thin, numerous, conspicuous; color rich reddish brown; specific gravity, 0.8220, 0.8387, average 0.8304; ash, 1.15, 1.18, average 1.17; weight per cubic foot, 51.74 pounds; fuel value, 0.8207. Collected by C. G. Pringle in the valley of the lower Rio Grande.

Acacia flexicaulis. Wood exceedingly heavy and hard, compact, close-grained, satiny, containing many minute evenly distributed open ducts; layers of annual growth hardly distinguishable; color very dark rich reddish brown slightly tinged with purple, the sap-wood clear bright yellow; specific gravity, 1.0482, 1.0289, average 1.0386; ash, 3.30, 3.27, average 3.28; weight per cubic foot, 64.72 pounds; fuel value, 1.0046; unsurpassed in value as fuel by the wood of any tree of the lower Rio Grande valley, and used for pulleys, rollers and other objects demanding great strength and solidity. Collected by C. G. Pringle in the valley of the lower Rio Grande.

Prunus ilicifolia, var. *occidentalis*. Wood heavy, hard, very close-grained, satiny; layers of annual growth plainly marked; medullary rays thin, conspicuous; color pale reddish brown, the sap and heart-wood hardly distinguishable; specific gravity, 0.8340, 0.7654, average 0.7997; ash, 0.84, 0.95, average 0.90; weight per cubic foot, 49.84 pounds; fuel value, 0.7927. Collected by T. S. Brandegee on Santa Cruz Island, California.

Crategeus Crus-galli, var. *berberifolia*. Wood heavy, hard, very close-grained, satiny, susceptible of a good polish; layers of annual growth hardly distinguishable; medullary rays numerous, very obscure; color brown tinged with red,

that of the sap-wood rather lighter; specific gravity, 0.6111, 0.6141, average 0.6126; ash, 1.52, 1.71, average 1.62; weight per cubic foot, 38.17 pounds; fuel value, 0.6027. Collected by C. E. Faxon and C. S. Sargent near Opelusas, Louisiana.

The wood of the variety is considerably lighter than that of the species, as determined by the Census investigations (average 0.7194).

Lyonothamnus asplenifolius. Wood very heavy, hard, close-grained, compact, satiny, susceptible of a good polish; layers of annual growth hardly distinguishable; medullary rays numerous, thin, obscure; color bright clear red faintly tinged with orange; specific gravity, 0.8358, 0.7700, average 0.8029; ash, 0.53, 0.49, average 0.51; weight per cubic foot, 50.05 pounds; fuel value, 0.7988. Collected by T. S. Brandegee on Santa Cruz Island, California.

C. S. Sargent.

New or Little Known Plants.

Ilex longipes.

THE species of *Ilex* fall into several natural groups which are readily separable when the necessary characters are at hand, but it is hard to satisfactorily discriminate between certain of the component species of these groups. The plant that Mr. Faxon illustrates in this number is one of these (p. 345). Drummond, Beaumont and Buckley collected it many years ago in the south, and their specimens mainly appear in herbaria as *I. decidua*, of which species Dr. Gray held it to be a variety. Some years since it was found in Tennessee by Dr. A. Gattinger, who referred it to *Nemopanthes Canadensis* in his list of Tennessee plants, but, on sending it to Dr. Chapman, received the above manuscript name for it.

In its general characters *Ilex longipes** is quite similar to *I. decidua*, but differs in its elliptical or broadly lanceolate leaves, sparingly ciliate, with short, broad hairs, but otherwise glabrous, whereas those of the latter are broadest toward the apex, so as to be spatulate or oblanceolate, and apparently always pubescent on the under side, at least on the midrib. The most striking difference, however, and that to which the species owes its name, is in the fruiting pedicels, which, in this species, are about an inch long, whereas in *I. decidua* they scarcely exceed the drupes in length.

So far as is shown by herbarium specimens, *Ilex longipes* occurs from North Carolina and Tennessee southward to Alabama and Louisiana. It is not yet known in cultivation.

Shaw School of Botany, St. Louis.

W. Trelease.

New Orchids.

IN complying with a request to furnish occasional reviews of new Orchids my purpose will be to give a summary of the novelties described in European horticultural publications. Many of the plants described have little value from a horticultural point of view, but it may be best to include most of the novelties and leave to cultivators the choice of kinds suited to their various tastes and requirements. A few Orchids not new may be sufficiently rare or interesting to deserve notice.

ERIDES AUGUSTIANUM, Rolfe, is one of the earliest novelties described in the present year. It was discovered in the Philippines by M. Auguste Linden, after whom it is named. It is allied to *A. Rabelenii*, Rchb. f., but the flowers are of a light, rosy tint instead of yellowish white. It is described in the *Gardeners' Chronicle* on January 4th, p. 9, and also figured in that journal on February 22d, p. 233, fig. 36, and in *Lindenia*, vol. 5, p. 39, t. 210.

CYPRIPIEDUM × *NIOBE*, Rolfe, is a very elegant hybrid raised from *C. Spicerianum* fertilized with the pollen of *C. Fairieanum*. It was raised by Mr. Seden for Messrs. James Veitch & Sons, of Chelsea, and was awarded a first-class certificate by the Royal Horticultural Society, December 11th, 1889.—*Gardeners' Chronicle*, January 4th, p. 9.

ANGRÆCUM ICHNEUMONEUM, Lindl., is a curious little plant which has long been known to science, but which has been

* *Ilex longipes*, Chapman, ined.—Trelease, in *Trans. St. Louis Acad. Sci.*, v. (1889), 346.

somewhat recently introduced to cultivation. The flowers reminded Dr. Lindley of an ichneumon fly, hence the name. The curiously inflated spur is much like the bladder of a small fish. The white flowers are borne in long, pendulous racemes, yet the plant is rather curious than beautiful.—*Gardeners' Chronicle*, January 11th, p. 38.

CYPRIPEDIUM \times CYTHERA, Rolfe, is a pretty little hybrid, raised in the collection of Mr. R. H. Measures, of Streatham. It is said to be derived from *C. Spicerianum* fertilized with the pollen of *C. purpuratum*. The flowers much resemble the former, and curiously enough there is no trace of tessellations in the leaves, yet the dwarf habit and some characters in the

C. \times Lathamianum, a fact overlooked at the time the other was described.—*Gardeners' Chronicle*, January 25th, p. 105.

CALANTHE \times VEITCHII ALBA, Rolfe, is a very beautiful hybrid raised in the collection of Sir Charles Strickland from *C. vestita* and *C. Rosea*; thus it has either the same or the inverted parentage of *C. \times Veitchii*. It is, however, markedly different, having the strongly four-lobed lip of *C. vestita*, while the flower is of the purest white, without any trace of color anywhere. It is a great horticultural acquisition.—*Gardeners' Chronicle*, February 1st, p. 132.

PHALÆNOPSIS \times CYNTHIA, Rolfe, is a handsome natural hybrid between *P. Aphrodite* and *P. Schilleriana*, which appeared



Fig. 46.—*Ilex longipes*.—See page 344.

flower appear to be derived from the other parent.—*Gardeners' Chronicle*, January 18th, p. 73.

DENDROBIUM \times XANTHOCENTRUM, D. \times JUNO and D. \times LUNA, are three hybrids raised in the collection of Sir Trevor Lawrence, which received first-class certificates at a meeting of the Royal Horticultural Society on January 14th last. The first, which resembles *C. \times Schneiderianum*, was obtained from *D. Findlayanum* and some unknown species, the second from *D. Wardianum* and *D. Linawianum*, and the third from *D. Findlayanum* and *D. \times Ainsworthii*.—*Gardeners' Chronicle*, January 18th, pp. 87, 88.

CYPRIPEDIUM \times HERA, Rolfe, was raised in the collection of Mr. R. H. Measures, of Streatham, from *C. villosum*, crossed with the pollen of *C. Spicerianum*. Thus it is identical with

in the collection of Mr. F. Wigan, of East Sheen. It approaches the last named species in most of its characters, the front lobe of the lip being almost identical in character, while in *P. \times leuconrhoda* and *P. \times casta*, which have the same parentage, that organ is long and slender, as in the other parent. A paler variety with the same structure has since appeared with Messrs. Hugh Low & Co.—*Gardeners' Chronicle*, February 1st, p. 132; February 22d, p. 227.

CYPRIPEDIUM \times NORTHUMBRIAN, N. E. Br., is a hybrid raised in the collection of Mr. D. O. Drewett, between *C. \times calophyllum* (itself a hybrid between *C. barbatum* and *C. venustum*), and *C. insigne Maulei*, the latter being the pollen parent.—*Gardeners' Chronicle*, February 8th, p. 160.

CYPRIPEDIUM SIAMENSE, Rolfe, is a species introduced by M.

J. Garden, of Paris, from the neighborhood of Bangkok, in Siam. It is allied to *C. callosum*, and a colored figure which appeared in the *Moniteur d'Horticulture* for March 10th suggests the question whether it is botanically distinct from that species. —*Gardeners' Chronicle*, February 8th, p. 161.

Kew.

R. A. Rolfe.

Cultural Department.

Notes on Shrubs.

SHRUBS which have the habit of blooming in the early part of July are not numerous in species in this latitude and every one which makes any show is valuable even if it has defects which would cause an earlier flowered species to be considered of little value. There appears to be a slight cessation of blooming among the shrubs just now, but a little later a series of late flowering species becomes quite conspicuous.

Itea Virginica, for which no more popular name than its generic one appears to have been invented, is a rarely cultivated shrub which is especially valuable for blooming at this season, and it usually attains its best condition in the first week of July. It is a dwarf shrub of slender habit and under cultivation it seems to rarely grow to a height of more than two or three feet. The flowers are borne in dense, terminal, almost perfectly cylindrical racemes from two or three to four or five inches in length, and about or nearly three-fourths of an inch in diameter. Although the pointed, narrow petals are white or creamy white, a greenish white effect is given to the racemes by the stamens and pistils, and the outside of the flowers, which are light green in color. The fragrance seems to have something of the qualities of the wild Grape and of *Clethra* blossoms, but is not so strong or sweet as either. The rich color assumed by the foliage in autumn is another quality which makes these plants desirable for the shrubbery. Although a native from New Jersey southward, the *Itea* is perfectly hardy in Massachusetts. Where naturally-grown plants cannot be obtained and transplanted from their native habitat they may be propagated in the usual way by seed, by cuttings, or by division of the roots, which slowly spread and form clumps of stems.

Probably the most conspicuous flowering hardy shrub at this season is our common Elder (*Sambucus Canadensis*), which blossoms here in the last of June and first week or two of July just as the flowers of one of the latest *Viburnums* (*V. molle*) are fading. The common Elder is usually considered valuable on account of its general freedom from disease. But there are complaints this season from various parts of the state of serious destruction caused by the Elder Rust (*Aecidium Sambuci*), both to plants cultivated for ornament and those growing wild. This fungus attacks both the leaves and young shoots, and its effect is to cause large swellings and distortions of the parts diseased. When the spores are ripe the swellings have a dusty yellowish appearance. So serious has this disease appeared in some localities this season that it seems as if the destruction of the Elders must inevitably follow. No remedy can be at present suggested except to cut off and at once burn the affected portions before the spores reach maturity. The Elder Rust is found over a large extent of the country, probably wherever the Elder is indigenous.

Notwithstanding the many beautiful hybrids and other forms of *Rhododendrons* which have been produced by the skill of the hybridist or horticulturist, there are few which possess a greater charm and delicacy of color than our native *R. maximum*. Its value is enhanced in the eyes of all admirers of beautiful flowers by its habit of blooming in July when it has no conspicuous competitors, the blossoms of nearly all other *Rhododendrons* having long since faded. But besides this evergreen *Rhododendron* we have two other native deciduous species, belonging to the *Azalea* section of the genus, which bloom at about the same time. These are our common Clammy *Azalea* or so-called White Swamp-Honeysuckle (*R. viscosum*), and the Smooth *Azalea* (*R. arborescens*), which is not found so far north. The flowers of the Clammy *Azalea* are comparatively so small that they are not so valuable for ornament as they are for the fragrance which they exhale. The plant grows freely and flowers profusely in cultivation, becoming a tall, upright-growing shrub.

But the Smooth *Azalea*, figured on page 401 of the first volume of GARDEN AND FOREST, is greatly superior to *R. viscosum*, inasmuch as its flowers combine fully as rich a fragrance, with more than double the size, and, besides, are much less clammy. Although the flowers are partly hidden by the foliage, they are not more so than is necessary for protection from the withering influence of the hot summer sun. The corollas expand in their widest part fully two inches

across from tip to tip of petals. They are usually white, but vary in some plants toward a decided rosy tinge of color. The long stamens and pistils are bright red, becoming paler or light pink toward the base, and the anthers are yellowish. In this climate the blossoms are usually in their best condition during the last week of June and first week of July, and may be counted but very few days in advance of those of *R. viscosum*. Plants of *R. arborescens*, raised from seed collected in North Carolina, and now ten years old, are bushes from three to four feet high, with as great a spread of branches. They are perfectly hardy, but, as a rule, not very profuse in their bloom. In its native habitat it is said to become fifteen or twenty feet in height, but its low spreading habit in open cultivation here is in striking contrast with the more erect habit of plants of *R. viscosum* of the same age. *R. arborescens* does not appear to have been much used in hybridizing with other species.

Arnold Arboretum.

J. G. F.

The Strawberry Season.

THE Strawberry season of 1890 was a short one. On June 3d I picked the first ripe berries of Pearl, Jessie and Bubach. I could probably have done this on the 1st had not my friends, the birds, been sampling them since they began to color. The Bubach had probably been overlooked, which accounts for my ability to pick it with the others, as it is generally two or three days later. On the 5th I was able to pick three quarts for the table and the season was fairly open.

I find on reference to my notes of last season that this was three days later than last year, and the last picking of any amount was made on the 21st, though there were a few late comers until the 26th.

The quality of the fruit was good as long as sunny weather prevailed. On the 12th, 13th and 14th rain fell freely, and the three following days were dull, so the abundance of moisture and the absence of sunshine soon caused a depreciation in flavor, and bad color. The berries at once became soft and decayed quickly, and the blight was on hand to do its fatal work. This reduced the crop very materially and necessitated great care in picking.

The Pearl still suits me for size, shape, beauty, vigor and quality. It ripens evenly and the berries from the largest to the smallest are generally perfect in shape and well filled out.

The Jessie occasionally produces a large berry of cocks-combed shape, but on the average the fruit runs no larger and yields less abundantly on my soil. The chief fault of the Jessie with me is its uneven ripening. For the first week, at least, one third or more of the berries which were crimson on one side were white or green on the other. This adds very much to the time and labor of picking if one is careful to avoid picking the unripe ones. Toward the close of the season this feature is less apparent. Mr. Charles A. Green, the introducer of this berry, tells me that this characteristic does not develop at Rochester.

The Bubach, as a rule, is a little later than Jessie. It is a vigorous grower and productive. The first berries to ripen are generally twins, but perfect in shape. The texture and quality is not quite as good as the preceding, and the rain and absence of sunshine told on them in this respect more severely. For productiveness and large size under favorable conditions this variety will give great satisfaction even though the quality is a little inferior to that of others.

Jewell is very much like it in texture and quality and more subject to rust, so much so as to render it quite worthless with me, and each successive season it seems to be more subject to these fungi. If this proves to be the case with Bubach it will be short-lived. Last season I did not notice that it was at all affected, and I had higher hopes of its future than I have now. Belmont produces a few large berries at first, but like the Sharpless the later settings are abnormally developed and unsightly. A poor cropper it is, too, with me.

I have many newer varieties, but a single season's experience will not justify any judgment of their merits.

Montclair, N. J.

E. Williams.

Among the more recently introduced Strawberries none are proving more generally satisfactory in our state than the Warfield No. 2, Jessie and Haverland. The peculiar merits of the Warfield lie in its deep, brilliant and glossy color, which gives it a most attractive appearance, the firmness of its flesh and skin, which enables it to endure carriage remarkably well, and its great productiveness, which renders it a very profitable variety to grow.

The Jessie surpasses the Warfield in size and quality, and possesses the further advantage of being perfect in flower.

At the recent summer meeting of the Wisconsin State Horticultural Society, the Warfield and Jessie were pronounced the most profitable market varieties, the Jessie being used as a fertilizer for the Warfield. The superior quality and large size of the Jessie render it a favorite garden variety wherever it has been introduced, while in productiveness it is little inferior to the Warfield, or any other variety thus far tested.

The strong point of the Haverland lies in its great productiveness. Aside from this it would hardly attract attention. Bubach No. 5, though very fine as a berry, does not appear to possess the vigor and prolificacy of the above named sorts. The Cloud does not promise well. I have not yet seen a favorable report from it in Wisconsin. Gandy is proving fairly productive of large and good looking fruit. Gypsy is very promising as a first early sort. It ripened with the earliest bearing of the Crescent, and while not equal to the latter

from a nursery company. These were given similar care, but the plants from the nursery have been already nearly destroyed by the rust, while those received from Mr. Smith are almost free from it.

University of Wisconsin, Madison, Wis.

E. S. Goff.

Our Strawberry crop is now just past its best (June 30th); but for the excessive heat of the past week we should have had most excellent picking till after the 4th of July. I think it an underestimate to put the loss from sun-scald at twenty-five per cent., besides the softening of as many more, which we could only save by shipping them to a near market; still, in spite of the excessive rainfall and this continued heat, the crop, even at from five to eight cents a quart, has paid better than any of its predecessors for ten years.



The Silk Cotton-Tree at Nassau.—See page 341.

in productiveness, very far surpasses it in quality. Lady Rusk is thus far disappointing. It is only moderately productive, and the fruit is small, deformed and insipid. Welch promises well. The plant possesses remarkable vigor and is quite productive. The fruit is large and of good quality, but its pale color will hardly favor it as a market variety. Pineapple is of high quality and fairly productive, but like the above its pale color will not commend it for market.

In a few localities the Wilson still maintains popularity, but it is generally so much injured by rust as to be no longer profitable. Some reasons appear for believing that the liability of this old standard to the rust is due in a measure, at least, to an enfeebled condition of the plants. Mr. J. M. Smith, of Green Bay, has been remarkably successful with the Wilson, and has for years set out his new beds only from plants taken from thrifty young beds that have not yet borne a crop. In the spring of 1889 I procured some plants of the Wilson from Mr. Smith and about the same time some of the same variety

The six best-paying varieties are Jessie, Bubach No. 5, Warfield No. 2, Haverland, Crescent and Miner's Great Prolific. The Jessie is worthy first place here, because of its perfect blossom, large size, good quality and productiveness. After ten days' picking, without reserve, I stepped to the end of one matted row, two feet wide, and picked eight feet of the row for two quarts, and in each box there were a number of berries as large as hen's eggs; this was without selection. Haverland has suffered worse with the heat and sun-scald, and being soft and of poor quality, will not take high rank, though more productive and larger than Crescent.

We have potted Wilson, and still plant it for pollen, but unless the rows have at the rate of 100 loads of manure to the acre, it is not a paying berry; and among the fifty kinds we grow, of old varieties Miner's Great Prolific is ahead this season in size, productiveness and for pollen. For a late berry we find nothing superior to Gandy.

Janesville, Wis.

George J. Kellogg.

Notes on American Plants.

THE Maryland Pink Root (*Spigelia Marilandica*) is an attractive plant at the time of flowering, and its long red corolla is about as conspicuous as that of the Cardinal Flower. It is from six inches to a foot and a half high, bearing several tubular flowers over an inch long. The tubular or lower portion of the flower is about a third of an inch in diameter, tapering toward the base. The opening at the top is about half an inch wide and yellow inside. It is a herbaceous perennial, a native of rich woods from Pennsylvania to Wisconsin and southward. It likes a light, loamy soil in the shade.

Sedum pulchellum, a native of the southern states, is a pretty garden plant forming dense beds. Its stems are somewhat weak and often trailing, and are about eight inches long. At the summit is a several spiked cyme of pale rose-purple flowers. It is of little or no value for cutting, but is a pretty border plant, not only when in flower, but its dense foliage is handsome the season through. It needs a light soil and sunlight.

Calochortus Howellii, a newly discovered species from Oregon, has handsome white flowers an inch wide, with dark brown beards on the lower inner half. But the plant is not healthy in our light, loamy soil, and the leaves die before the flowers open. It might thrive in a heavier soil. We have known it but one season.

Pentstemon laevigatus, var. *digitalis*, is a desirable native species with larger and handsomer flowers than the more common *P. pubescens*. It is a native of rich, dry soils in the southern states. It grows two or more feet high, bearing numerous pale purple or white flowers an inch long. Though a native of a warmer climate, it seems perfectly hardy here and is certainly worthy of cultivation.

One of the easiest California Lilies to grow in this climate, and an attractive one, too, is the *Lilium pardalinum*. It seems to do well both in heavy and light soils, and unlike some of the species from the Pacific coast, the foliage shows much health and freshness during most of the summer. Its height here is about two feet, and it bears one to several (according to the strength of the bulb) good-sized, orange-red and spotted flowers, the divisions of which turn back to nearly meet the stems on which they are borne.

Another good species for light, loamy soils is *L. rubescens*, from the same state. This one, however, is more particular about its location, and in a clay loam it never seems to thrive with us. It is a valuable species bearing a dozen or more erect, nearly white, fragrant flowers with dark brown spots. With age the flowers turn to a reddish purple. They resemble those of the *L. Washingtonianum* in shape, size and color, but those of the latter are turned downward. This last species is not a healthy one in our light soil, and both flowers and leaves seem to die even before the flowers have opened.

Another interesting species from this state is the *L. Humboldtii*. It seems to need at least two years to become established. Then, if well fed, it will give a fine display of its large salmon-yellow and spotted flowers. We have found well decayed chip-dirt, sifted and applied as a top dressing, the best fertilizer for this species, and a soil having a slight mixture of clay seems to suit it.

Southwick, Mass.

F. H. Horsford.

Rose Notes.

A LARGE number of Roses have already been planted in preparation for next winter's cut-flower supply, some of the Hybrids for early forcing having been planted in the beginning of April, and in some progressive establishments the Teas followed shortly afterward.

Of course it requires some moral courage to clear out a Rose-house so early in the season, especially if the plants are in fair condition and still producing a respectable crop of flowers, but it undoubtedly gives the new planting a much better chance to become well established and to make some strong and vigorous growth before the days get too short. It is well to remember, however, that even though the Roses have been planted out in April or May it is not advisable to crop them too heavily in October, for the mid-winter crop may be correspondingly light if the plants are allowed to overtax their strength. Disbudding should therefore be regularly attended to until the flowers are needed in quantity. Strong, healthy young plants in three or four-inch pots are preferable for planting out, as the weak, stunted ones sometimes used as a makeshift for this purpose seldom start away properly, and as a consequence prove unsatisfactory for winter-blooming. It may be repeated that the Roses when planted out should always be moist at the root, for when the old ball of earth is dry at the time of planting it will be very difficult to moisten it afterward without making the soil in the bench or bed too wet.

As regards the two chief systems of planting Roses for winter flowering—that is, either the shallow bench system or the solid bed plan—it may be said that the first named is decidedly the most in favor, and it is now quite an exception to the rule to see a house planted on the solid or deep-bed system.

Neat staking and training adds much to the appearance of a Rose-house, and is certainly not detrimental to the plants, and this may easily be arranged by adopting the method used in commercial houses for several seasons, where the plants are supported by wires stretched from one end of the bench to the other. The wires are attached to a light post or other suitable support at each end of the bench, and the plants are tied to the wires as it becomes necessary. Stout galvanized wire is best for this purpose, as it does not rust out so quickly as the plain wire, and with proper care at the time of replanting it will last for three or four seasons. This makes a much more orderly arrangement than the old-fashioned method of individual staking, and unless the benches are too wide it does not interfere with the cutting of the flowers or any other necessary routine work.

The usual long list of new Roses for 1890 has been presented by the European growers, and numbers some seventy or eighty sorts, the larger proportion of which are classed among the Hybrids, though the list of Teas is also extended by some twenty-five names, several of which are described as carmine or red in color. It is also stated that a new pink Tea is to be introduced next autumn which is claimed to be far superior to Catherine Mermet. This promised acquisition is of French origin, and has been christened Maman Cochet.

Among the Hybrids, Augustine Guinoisseau will be looked upon with interest. It is a new sport from La France, which is described as being identical with its parent in all respects save in color, which is pure white. If this should prove as good as described it would probably be a valuable variety, but it may be safely estimated that not more than ten of the new Roses of 1890 will prove worthy of general cultivation unless the list has been much more carefully sifted than in previous years.

Holmesburg, Pa.

W. H. Taplin.

Border Pinks and Carnations.

A GARDEN is never too well supplied with these valuable flowers and no plants better repay the trouble necessary in their cultivation. The early Fringed Pinks are of a very sturdy constitution, and the stems being thin and wiry are very little affected by alternate freezing and thawing. The white variety is especially valuable and very fragrant. The Scotch gardeners have originated many fine varieties, which they divide into "show" and "laced" sections, the former being self-colored and the latter having rosy red or purple lacings. They are readily grown from seed, blooming the second season, and a good strain will show great variety in markings, with either smooth or fringed petals. They are fragrant and a large proportion will be double.

The border Carnations follow the Pinks in bloom, and very good varieties may be readily secured the following season from seed sown in the spring, for they seem perfectly hardy the first winter or when in a young state. After the wood becomes heavy and hard they are not reliable, and if it is desirable to save any they should be layered or the tops should be struck after blooming. A good strain of seed should be sown each spring with the annuals, and seedlings should be grown along till fall, when they may be planted in their blooming quarters. A few evergreen boughs make good protection for winter, though this is hardly necessary. In late June such plants will give a wealth of bloom, and though a proportion will prove single, one is sure to secure some attractive double ones. At the worst one can have abundance of bright, fragrant flowers with a good supply of their own foliage—a pleasure usually denied us by the vender of Carnations. If one does not care to trouble with this biennial treatment of the Carnation, some very choice proved varieties may be had from the florists. Of these a good selection would be Old Crimson Clove, or its dwarf variety, Paul Engelheart, Blush Clove, Gloire de Nancy (white), Mrs. Reynolds Hole (salmon), Pride of Penhurst (yellow). The layering system should also be followed with these if certain success is desired.

The "Carnation Grenadin" of the seedsmen is also desirable, being scarlet (of a variety of shades) and usually double.

Elizabeth, N. J.

J. N. Gerard.

Heleniums.—Of North American Composites there are few more valuable for garden culture than these plants. Their flowering season lasts over the greater portion of the summer, beginning in May with *H. Hoopesii*, and ending with *H.*

autumnale late in fall. *H. Hoopesii* is perhaps the showiest and best of all, and should be in every garden of hardy flowers. It is as showy as *Coreopsis lanceolata*, and has stout, erect stems, with numerous large, bright orange-colored flowers, just when no other similar flowers are to be had. The flowers are larger than those of the *Coreopsis*, and as they are of good substance stand well when cut. *H. Bolanderi* is a new species, one of Dr. Bolander's discoveries in north-eastern California, where it grows in low grounds near the coast. This species flowers in June soon after *H. Hoopesii*, and makes a nice succession to that species. The flowers are not as large, but are of a pleasing bright yellow. The ray florets are notched at the end, and give the flower-heads a pretty appearance, not unlike those of the *Gaillardias*. We have noticed some variation in the color of the flowers in a batch of seedlings, some being much darker than others. Both the above flowers have black discs or centres. *H. Bolanderi* is perfectly hardy here, growing about eighteen inches high. It is free flowering and useful for cutting, and like *H. Hoopesii*, it comes readily from seed sown in pots. When large enough these should be planted where they are to flower, for, with *Heleniums*, as with many other herbaceous perennials, the less disturbance during the earlier stages of the plant's life, the better will be the bloom when the flowering period arrives. These *Heleniums* will not flower the first year from seed, but if well treated a quantity of bloom will be produced the second and following years.

South Lancaster, Mass.

E. O. Orpet.

Polemonium pauciflorum, now in bloom from seeds sown early in the year, is a native of the province of Chihuahua, Mexico, and was first offered this year by Mr. W. Thompson, of Ipswich. It is an interesting variety, because other species of *Polemoniums*, with the exception of *P. flavum*, are blue flowered. The flowers of this one are pale yellow in the interior of the corolla and yellowish tinged slightly with red on the exterior. The flowers are funnel-shaped, some two inches long, with a spreading five-lobed mouth, and are produced from the tips of the stems and branches in clusters of from two to eight. The plant forms a bushy tuft twelve to eighteen inches high, with the neat foliage characteristic of the family, and as the flowers are pendent or drooping it is very graceful and attractive, though by no means showy. It is said that it blooms in succession from July to October, and is classed as a hardy perennial, which points remain to be tested. There seems to be no variation among my score or so of plants either in growth or bloom.

Elizabeth, N. J.

G.

Correspondence.
Communal Forests.

To the Editor of GARDEN AND FOREST :

Sir.—The *Rural New Yorker* of July 5th contains a contribution by Mr. Charles Barnard on Communal Forests, a subject which deserves the attention of all persons interested in forestry. Referring to the increasing number of abandoned farms and uncultivated, apparently valueless lands, which in the older eastern states reduce the tax-paying capacity of the township, he suggests that by planting these waste, non-producing lands to forest a revenue might be derived from them. "A man," the writer says, "may not live to grow trees for a crop—a town can, because it is itself immortal. Why, then, should not a township grow timber?"

The suggestion, not novel in itself, is a good one, and should command careful consideration, not only by the friends of a rational forest-policy, but by every citizen who is interested in the prosperous condition of the town in which he lives. If every community will concern itself in the rational use of the land within its borders, if every town and every county will give profitable occupation to its waste lands by utilizing them for forest-growth, the movement would not only increase the financial prosperity of each community, but the efforts of those who work for a rational forest-policy in the country at large would be subserved by every communal forest established. In fact, no better method of forest-reform could be suggested than by beginning forestry in each town, which as a part of the country at large, will influence the movement of the whole. As to the desirability of communal forests—of which we have an example in the first town forest in the United States, at Lynn, Massachusetts—there can be no question.

Whether the method of inaugurating such action on the part of the communities as Mr. Barnard proposes is the proper one need not be discussed here, and whether his plantations would prove profitable as readily as he anticipates is open to serious question. Upon this last point Mr. Barnard himself contradicts his anticipations, for while he figures early returns from

his plantings, he admits at the same time that forestry may not be a business for private enterprise, because of the long time before the investment pays. This is the very bane of forestry reform. If it could be shown as a general proposition that forestry was a paying enterprise from the start or after three to four years' waiting, it would not be difficult at once to interest capital in forest-planting. There may be returns from thinnings, and the farmer who does not calculate his time while cutting and preparing the material which comes from the thinnings, may find a profit thereby; but even in Germany, where labor is cheap and every kind of wood material is used, necessary thinnings are omitted from calculation because "they do not pay for the work." It would be folly for the townships or counties to engage in forest-planting, except with a full realization that they build for the future, and that no returns can be expected within a decade or more.

The case stands differently in communities where the waste and brush lands can be aggregated with some already productive timber-lands into the communal forest, for the returns from the latter part of the property may, under rational management, be made to pay in part for the improvements and superintendence of the remainder. The profitability of forests begins to assert itself only after a considerable period of time and after a large enough area has been brought under systematic management.

It takes, then, years and patient waiting, expenditure at first and rational management, to establish a profitable forest.

That such properties can ultimately be made profitable, even under our present conditions, which differ from those of France and Germany considerably, I have no doubt.

In Germany I know of communities where not only all taxes are paid by the revenue from the communal forests, but every citizen receives a dividend in addition. The town of Görlitz, in Silesia, is an example; also the town of Münden, where one of the Prussian forest-academies is situated. The town of Goslar, in the Harz Mountains, derives from 7,500 acres of forest an annual revenue of \$25,000 to \$30,000, and it may be of interest to American farmers to note that it receives the highest prices for its wood products on account of the excellent roads, which facilitate transportation. The capital invested in making and keeping in order these roads is calculated to yield twenty per cent. yearly on the investment.

From the excellent report of the Forest-master of the City of Zurich (Switzerland), which gives the history of the city forest, going back to the fourteenth century, it appears that the revenue derived from its less than 3,000 acres averaged \$15,000 annually during the decade from 1860 to 1870, and \$18,600 during the next decade. How forest-property under management appreciates in value appears from the following table, which shows in the forests belonging to the canton of Zurich, and comprising about 82,000 acres, during a period of fifty years, almost a threefold increase both of yield and value.

The figures as to yield, expenses and valuation are for a single acre.

Decade.	Gross yield.	Outlay.	Net yield.	Capital value.
1830 to 1840, . . .	\$3.25	\$0.85	\$2.40	\$60.20
1840 to 1850, . . .	3.50	1.01	2.49	61.90
1850 to 1860, . . .	4.59	1.02	3.57	89.24
1860 to 1870, . . .	7.06	1.29	5.77	144.43
1870 to 1880, . . .	8.84	1.87	6.97	174.33

The price now is nine to twelve cents per cubic foot, and sixty to seventy cents per day for wages.

While, then, no move in forestry reform could be more promising than the establishment of communal forests; while eventually these forests will be profitable and sources of handsome revenues, we should not expect the impossible from the forest-commissioners and foresters who shall be called to inaugurate the movement.

Washington, D. C.

B. E. Fernow.

[A full description of the public forest of the City of Lynn or the "Lynn Commonwood," alluded to by Mr. Fernow, has already been given in GARDEN AND FOREST (ii., 526). The early towns of New England held their woodlands and pasture-lands in common, and some 1,400 acres of this land belonging to the City of Lynn now returns to its original character as woodland held in common; but from its position its highest use will be that of a free public pleasure ground.

In an early number we shall publish the first of a series of letters describing the most interesting features of the forest of the City of Zurich, to which Mr. Fernow refers. The letters have been prepared by a young American who is studying forestry in Europe.—Ed.]

'The Evils of Grafting.

To the Editor of GARDEN AND FOREST:

Sir.—As Mr. S. B. Parsons does not approve of Mr. Burbidge's opinions on grafting, may I ask Mr. Parsons, whom I had the pleasure of meeting in America, a few simple questions.

1. I have a number of American Weeping Willows, and in nearly every case the suckers of the common Sallow, on which they are grafted, are springing up and killing them. It is not in the garden proper and I am too busy to keep a man looking out for suckers in out-of-the-way places. Let me ask him if grafting in this and like cases is right. I buy a delicate and graceful tree worked on a vigorous one, which must in time kill it if not carefully watched.

2. I bought one hundred plants of the common *Pyracantha* to form a low fringe above a sunk fence where I wanted the view clear. In every case suckers of the common Quince came up, notwithstanding some care. Does Mr. Parsons think this is right? In our country the Quince grows to twenty feet high. I wanted my *Pyracantha* to spread about as a low Evergreen on the ground and now I must have an eternal fight with suckers or remove the trees.

3. The Ribston Pippin Apple is of so fine a quality that it may be called the most famed of English Apples, but in England the tree is generally cankered and decayed. For a trial I planted it on every stock I could obtain, but I could not in Britain nor in Europe get the plant on its own roots. To get this apple into a vigorous state and free from the canker and decay which affect it would be worth a million guineas to England! Is it reasonable to suppose that every Apple does equally well on the Crab (or what we call the Crab), on which we generally graft? I have seen much to make me doubt it, but I am doing what I can to test the matter fully. I think from Mr. Parsons' long and wide experience and clear observation he will be able to throw some light on these questions.

I could ask other questions of the same kind and I believe his experience of the above mentioned sorts of disaster must be considerable. I am sure he is too reasonable to forget that the question is how the tree behaves in the plantation or garden after it leaves the nursery, and not the convenience of the nurseryman, who puts almost everything on a few easily raised stocks in preference to more natural ways of increasing trees by seeds, cuttings or layers.

Office of *The Garden*, London.

H. Robinson.

I will gladly answer Mr. Robinson's questions, although I see no connection between them and my reply to the strictures of Mr. Burbidge upon a previous article of mine in GARDEN AND FOREST. No intelligent or conscientious nurseryman will think, under ordinary conditions, of grafting a cion upon stock which suckers, or upon stock which is not closely related to it; but many nurserymen dissent from Mr. Burbidge's sweeping assertion that "any fruit-bearing or ornamental tree which will not succeed on its own roots had better go to the rubbish pile at once." They will also object to his assertion that "grafting is always a makeshift, and very often a fraud," as a reflection upon a large body of respectable men. And now for the questions.

1. The American Weeping Willow grows readily from cuttings and can be trained to any required height. I can see no advantage in grafting it.

2. We grow the *Pyracantha* by the thousand for hedges, and grow it by cuttings only. Seedlings will not answer here, for one variety only is hardy, and this will not come true from seed. I cannot conceive why any one should go to the expense of grafting on an unrelated stock like the Quince, or why any one should graft an evergreen tree on the root of a deciduous tree.

3. I do not know the cause of the failure of the Ribston Pippin. It may be an inherent weakness of constitution, and in that case a plant grown from layers would be equally weak. We have similar trouble in this country with the Newtown Pippin, and we overcome it by grafting twice, just as the French do to the Pomme Chataign, a variety which also has inherent weakness. In this double working we have a remedy which it would be unwise to neglect, although it is still more "unnatural" than grafting once. Transfusion of blood may be unnatural, but it has saved human life. If the Ribston Pippin cannot be grown

by double grafting, I would try layering; but the American market could never be supplied in this slow and expensive way.

Of course I can see no reason why plants which take root readily from cuttings should be increased by grafting, and I yesterday found myself very impatiently rooting out some Tea Roses which I had imported from England, and which were budded and overgrown by the stock. Our largest Rose-growers here, who produce 800,000 plants a year of Teas and Hybrid Perpetuals, grow them from cuttings only, and we cannot understand why English nurserymen bud Roses at all, unless it is some sort like the Persian Yellow, which does not strike readily from cuttings.

There is little need of adding anything on the general subject of grafting to what I have already said. Nearly all horticultural operations, even to the transplanting of seedlings, are "unnatural" in one sense. That is, they differ from Nature's ways, although they may not be opposed to Nature's laws. But why should it be called "more natural" to force a cutting to throw out roots than to place it on a stock and allow it to make use of roots already formed? I should use cuttings where they will root readily, because it is easier and cheaper than grafting. I have never observed that a tree from a cutting was more vigorous or long-lived than one from a graft when properly set. Near the spot where I am writing is an Oriental Spruce, which is one of the most beautiful and completely furnished specimens I have ever seen of any conifer. It was grafted forty years ago on a stock of Norway Spruce. Propagation by seed is probably the most "natural," but this is impossible when varieties are to be preserved. I know grafted Apple-trees a century old that are as healthy as any seedling tree. Seedling Apple-trees have sprung up all over the older settled parts of this country, and there are no statistics to show that as a class they are longer-lived than grafted trees. Some die young, some live to an old age, according to their vigor of constitution and the congeniality of their surroundings, and it is the same with grafted trees. I can show Mr. Robinson grafted Apple-trees still in healthy bearing condition which my father planted seventy-five years ago.

Flushing, L. I.

S. B. Parsons.

Low Spear Grass.

To the Editor of GARDEN AND FOREST:

Sir.—I enclose a sample of short grass which almost covers my lawn. It comes into flower and seed when not more than an inch or two high, so that the lawn looks gray and bad for patches of several rods square sometimes. It seems to be a good fighter and able to clean out other varieties and take possession entirely. Please tell me what species this is and what is to be done to exterminate it. It seems to get the best of Blue Grass even. It is certainly much worse here this year than it has ever been before.

Madison, N. J.

R. J.

[The enclosed was a specimen of *Poa annua*, Low Spear Grass, a near relative of June Grass and Fowl Meadow Grass, though differing much from these in habit. It is not a native of America, but comes from Europe. It may grow an inch high, or in new, rich soil a foot high. It loves cool, moist weather, and in damp soil and a cool climate it thrives well in the shade. A little scorching sunlight checks the plants on a dry soil at once and they soon die. Only very small, young plants, if any, live over winter. The blossoms appear very early in spring, probably before those of any other grass. Three or four distinct crops, possibly more, may pass in a single year from the seedling to the seeding plant; but we never heard before that it would crowd out Blue Grass. Professor Beal writes of this grass:

"I had for a long time considered it solely a nuisance on the farm, in the garden or lawn, as it is small and short-lived, but two years ago in August next I saw several lawns under the shade of trees, especially on the south side of Euclid Avenue, in Cleveland, Ohio, largely consisting of this grass. It was not allowed to lack moisture, and

was kept well mown; the light, bright-green color was most charming. There were whole rods of this lawn sometimes in irregular shapes unequaled by anything I ever saw before. There was some June Grass in places and some thin spots where the shade was dense. I did not learn whether this Spear Grass was purposely sown, or whether it had by degrees crowded out other grasses and clovers."

Perhaps the best way to exterminate this Spear Grass is to put the land in fine condition, when with sufficient fertilizer, moisture and light, the small Red Top or June Grass will be able to maintain a good footing against it.—ED.]

Recent Publications.

Elements of Structural and Systematic Botany, for High Schools and Elementary College Courses. By Douglas Houghton Campbell, Ph.D., Professor of Botany in the Indiana University. Boston: Ginn & Co., 1890; pp. 9—253.

It is frequently said, and with some reason, that science is easily learned in these days of abundant and good text-books. No doubt this is as true of botany as of the other sciences, and each new text-book should make the path easier and surer. Unfortunately, there is no royal road to learning, and one result of the great activity of to-day in scientific work, and the resultant specialization of its several departments, is that anything more than an *ipse dixit* knowledge of its general laws is becoming impossible for elementary classes that attempt everything. To lay as good a foundation as is possible for an understanding of such generalizations, most teachers attempt a little laboratory work in one or more directions, in addition to the customary lecture or recitation course. Professor Campbell's book appears to have been written for such teachers.

Inability to cover everything in any such course has given rise to a demand for elementary text-books treating in the simplest manner the practical study of certain parts of botany. Such books cannot, of necessity, be more than introductions to the study, and the courses based on them can be only preparatory to possible future special work in the branch covered. Their use should be possible under the guidance of a teacher of only average ability, or even without a teacher.

Excellent books of this character are both editions of Strasburger's "Botanisches Practicum" and their translations, the botanical part of Huxley and Martin's "Biology," the "Practical Botany" of Bower and Vines, which is an outgrowth of the latter, and the "Handbook of Plant Dissection" of Arthur, Barnes and Coulter. All of these attempt, in a somewhat similar manner, to give a more or less comprehensive knowledge of the structure of selected representatives of the principal groups of plants. The principles of classification of these groups are brought out incidentally in nearly all such books. Physiology is also fairly presented in books of a similar character.

A great stimulus was given to the study of structural botany and the German methods of classification by the publication and translation of the Text-Book of Sachs, nearly twenty years ago, a book which, in its more recent edition, has been divided into several. Some ten years ago Professor Bessey did a good piece of work for teachers by writing his "Botany," largely based on Sachs, and embodying most of its essentials for elementary work, and the needs of still more elementary classes are fairly met by the "Essentials of Botany," subsequently published by the same author.

Each of these books has its uses. None is perfect; but the teacher selects one or the other according to the requirements of the class to be taught. Those of the first group are best adapted to use for teaching methods in connection with a course of good lectures and demonstrations; the others are better adapted to the needs of the student who is to become familiar with representatives of the principal groups of plants and the prevalent basis of classification, when there are few accompanying lectures. Professor Campbell's book belongs to the latter class, rather than the former. It embodies the results of a considerable amount of original work, and contains many original illustrations. That the former adds nothing to the knowledge of the specialist, is no detractor from its merit in this place. The latter are fairly done. In the right hands, the book is likely to prove an acceptable and useful aid in teaching, though it must be admitted that most instructors would have been able to do their work had they been obliged to depend, as in the past, on the older books. It is to be hoped that if it comes to a second edition, the author

will specifically name the plants chosen for illustration, which will involve little additional work, and will remove a cause for just criticism of the present edition.

Shaw School of Botany, St. Louis.

William Trelease.

A *Catalogue of the Plants Found in New Jersey*, being volume two of the Final Reports of the State Geologist of that state, has appeared. It is from the pen of Dr. N. L. Britton, of Columbia College, aided by various specialists, and occupies nearly six hundred and fifty pages, with a full index, which adds to the value of the work. Dr. Britton, as is well known, takes an advanced position on the question of nomenclature, and it is well therefore, perhaps, to reproduce what he says in his introduction on the subject: "The names adopted are based strictly on the principle of priority of publication, the oldest specific or varietal name available being retained in whatever genus the plant is located, or whatever its rank as species or variety. Many of our plants have originally been described in genera other than those now accepted, and many were at first supposed to be species which are now regarded as varieties, or the reverse of this. The method adopted of citing the original author of the specific or varietal name—the only permanent portion of the binomial—in a parenthesis, tells us who first named the plant, while the added name behind the parenthesis shows who first brought the names together in their present combination. This method has, with slight modifications, been generally adopted by zoologists, and by students of fungi, algæ, lichens and mosses, and its general use in botany tends to bring all biological nomenclature into harmony."

Whenever the adopted names differ from those in general use in manuals or class-books of botany, these last are given as synonyms in italics. As a work of reference this catalogue, which is remarkably full in the geographical information it contains, might have been made, perhaps, more useful by the addition of a few references to easily accessible plant-portraits.

The list enumerates: Of flowering plants, 1,919; Ferns and their allies, 76; Mosses, Hepaticæ and allies, 461; Lichens, 329; Algæ, 987; Fungi, 1,705; Protophyta, 164. Total, 5,641.

Similar lists cannot be made too soon for every state, county and neighborhood throughout the nation. We read with regret of the rapid disappearance of many of our wild animals, such as buffalo, elk, deer and Rocky Mountain sheep. In like manner there are many agents at work which have already exterminated a large number of species of plants from entire counties.

Among these destroying agents are the clearing and cultivation of the land and the draining and burning over of swamps and marshes. In many regions fences along the highway have been abandoned, and often the land is cultivated for crops close up to the track of the wheels. The wood-lot is often used as a pasture. In this case the young growth of timber is nearly stripped clean; light enters; grass is encouraged and creeps in. The days of such wood-lots as supplies of timber are numbered; soon the old trees begin to die at the top, make a feeble growth, and the remains are removed for the plow and the meadow. Even along the railways, it is becoming customary to mow or burn the surplus land closely or to cultivate for crops.

In not a few instances the students of neighboring colleges and schools, and members of societies interested in collecting for the herbarium or for their gardens, besides collectors who sell plants to distant nurserymen, all help on the speedy extermination of many interesting plants.

Notes.

By the vote of the school children of New York the Golden Rod has been chosen as the "State Flower." Out of a total of 318,079 votes it received 81,308, while the Rose stood second with 79,666.

The Messrs. Putnam are about to publish a book called "The Trees of North-eastern America," by Mr. C. S. Newhall, with a brief introduction by Professor N. L. Britton, of Columbia College.

Few plants are more useful for the summer decoration of greenhouses than the Tuberous Begonias. Not long ago we saw a house full of these plants from which all the double ones had been rejected, and the effect was wonderfully rich.

The Rose-chaffer, whose depredations are described in another column by Professor Smith, has not been long in learning that the flowers of the great Japanese Lilac are suited to its taste. Wherever we have seen these flowers this season they have been preyed upon by Rose-chafers.

Edward Wakelfield, in his *History of New Zealand*, estimates that the introduction of bumble-bees into that country has already profited the farmers to the extent of \$5,000,000. Before their introduction it was impossible to grow Red Clover seed for lack of fertilizing agents.

In the Boston Public Garden there was lately in bloom a mass of white Ascension Lilies and azure-blue Delphiniums, which presented a most effective combination. The plants seemed informally mingled and they were much more effective from this irregularity.

The new Japanese Poppy Mikado is a really distinct and beautiful flower, the fringe of bright scarlet on the border of the white petals being very effective. It ought to be the parent of a new race of Poppies in which a wider range of colors will be united with the peculiar form of this variety.

In a paper read not long ago before the Rhode Island Horticultural Society, Professor Cushman, apiarist at the State Agricultural Experiment Station, declared that bees never attack sound fruit, but only such as is decayed or has been already injured by other insects; and his words were endorsed by all his auditors.

On one farm of 3,000 acres, entirely devoted to fruit, in Alameda County, California, from \$30,000 to \$50,000 are annually expended in wages. The laborers are in part Chinese and in part Portuguese. The latter are considered much the better workmen, and many of them have already established themselves on small fruit-farms of their own.

Our valued correspondent, Herr Carl Bollé, of Berlin, has long held the position of Chairman of the Division on Trees in the Society for the Promotion of Horticulture. The knowledge and experience thereby implied should render him especially useful in the position recently given him as a member of the Park Commission of the City of Berlin.

The famous old Elm on Boston Common, which fell in 1876, was especially beloved by Methodists, as under its boughs, in the year 1790, the first Methodist sermon ever heard in Boston was preached by Jesse Lee. A centennial celebration of this event was held on July 11th on the spot where the ancient tree used to stand.

Large quantities of compressed vegetables are annually prepared for use in the British army and navy. In addition to separate sorts, a mixed preparation is much esteemed which consists of forty per cent. of potato, thirty of carrot, ten of cabbage, ten of turnip, and ten of seasoning vegetables, such as onion and parsley. The method employed is to dry the vegetables and compress them into small slabs, which are packed in sealed tins.

The season so far seems to have been favorable for the development of forest fungi. The Ash anthracnose (*Gliosporium aridum*), a fungus closely related to the blight of the Sycamore, Oak and Maple, recently noticed in this journal, and the showy white mildew (*Microstoma Juglandis*), which covers the leaves of the Hickory, are both uncommonly frequent. No remedy has yet been discovered which is not too expensive for ordinary application.

In Germany, at least, landscape-gardeners are thought as worthy of honor as artists of other sorts. Not long ago we recorded the various ways in which Lenné's memory has been honored—by the placing of statues and painted portraits in public places and the naming of streets in more than one town. Lenné's most distinguished pupil and successor was Gustav Meyer, who died in 1877, and to him also a life-size statue has now been erected on the terrace of the Treptower Park in Berlin, which was his last work, and is usually thought his greatest.

An esteemed cotemporary kindly attempts to answer our request for information about the Crandall Currant by saying that it is identical with the Missouri Currant, *Ribes aureum*. This fact, however, is one which seems to be universally admitted. The question, originally asked by Mr. Thomas Meehan, is this: How does the Crandall Currant differ from varieties of the same species introduced twenty-five years ago under the names of the Utah Black and Utah Yellow Currants? We should like to know whether these earlier introductions have been kept distinct in cultivation.

The *American Garden* quotes from a western paper the measurements of three Apple-trees. One, which stands in Fairfield County, Ohio, and bears a fruit closely resembling Maiden's Blush, is nine feet five inches in circumference at three feet above the ground, with a spread of seventy feet in diam-

eter. Another, in Wayne County, Ohio, is ten feet four inches in circumference at one foot above the ground, and is known to be seventy-six years old. The third and largest is in the same state, in Washington County, and was planted in 1791 or 1792. The trunk, where it is smallest, girths twelve feet two inches, and the largest branch girths seven feet. It is a seedling, which bears a large yellow apple of excellent quality for cooking.

A German journal reports that about fifty novelties of American introduction were included in the last Chrysanthemum exhibition in London. The writer praises Mrs. Alpheus Hardy very warmly, and says the anticipatory reports were not overcharged except as regards the size of the blossoms, and their smallness he attributes to weakness in the plants caused by excessive multiplication. Among the finest of the other American novelties he notes Medusa, Shasta, Monadnoc (which is especially commended), John Thorpe, Mrs. Andrew Carnegie, George McClure, Mrs. A. J. Drexel, G. F. Moseman, J. C. Price, Beauty of Castlewood and Superbe Flore, which has been introduced in several German cities by an English firm and excited general admiration.

Referring to the note on wire-worms quoted in our last number from *The Garden*, Professor Smith writes that these worms have been for years among those pests for which we had no satisfactory remedies. Salt in corn hills has been used with more or less success, but has killed as many corn plants as wire worms. Experiments made during the present season indicate that in the potash salts, muriate and kainit, we have the long looked for remedy. Laboratory experiments prove positively that both of these substances are fatal to wire-worms, both the myriapods (*Iulus* sp.) and the spring beetle (*Elaterid*) larvæ, while the universal testimony of farmers who have been in the habit of using these substances as fertilizers is to the effect that they have not been bothered since they used them. It will not do to plant in a bed of either muriate or kainit, since the latter especially is dangerous to plant life; but a heavy top dressing some days before planting so that a rain will dissolve and carry the salts into the ground will prove fatal to most of the insects in the soil. Experiments indicate that the muriate is the more effective on insects and the least injurious to plant life.

In a recent number of the *Sanitarian* Dr. W. T. Parker protests against the thick planting of trees very near the house. Not only do they prevent the free access of air and of sunshine or even light, but they also injure the character of the soil as suited for permanent occupation. "A soil," says the writer, "loaded with roots and densely shaded is unfit for man to live upon constantly. . . . Vegetation produces a great effect upon the movement of the air. Its velocity is checked, and sometimes in thick clusters of trees or underwood the air is almost stagnant. If moist and decaying vegetation be a coincident condition of such stagnation, the most fatal forms of malarious diseases are produced. A moist soil is cold, and is generally believed to predispose to rheumatism, catarrh and neuralgia. It is a matter of general experience that most people feel healthier on a dry soil. In some way, which is not clear, a moist soil produces an unfavorable effect upon the lungs. A moist soil influences greatly the development of the agent, whatever it may be, which causes the paroxysmal fevers." Of course in the desire to avoid possible dangers it is not necessary to place a house on an absolutely bare spot, away from any tree, as is often done by rural builders, even when fine trees are within reach. Enough trees to produce an effect agreeable to the eye and comfortably to shade certain portions of the house and its immediate vicinity in summer, yet not so many as to render the soil damp or prevent the free circulation of air, or wholly shut out the sun. This should be the householder's ideal. Conifers are especially bad if many of them stand close to the house, because they exclude sunshine in winter, when one cannot have too much of it.

Mr. B. S. Williams, widely known as the author of the standard work on Orchid culture, "The Orchid Manual," died recently in his sixty-seventh year. He came of a family of gardeners, having worked as a boy under his father (who is still alive at the age of ninety-four) in the gardens of Mr. John Warner, a famous Orchid-grower of the time. His most noteworthy book was the outcome of a series of letters written to the *Gardeners' Chronicle* under the title "Orchids for the Million." It has gone through six editions, and his "Choice Stove and Greenhouse Plants" and "Select Ferns and Lycopods" are likewise esteemed as excellent manuals in their departments. For nearly half a century he has been a successful exhibitor of various classes of plants.

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The Chestnut-Tree.

THE Chestnut-tree differs from other trees of the northern hemisphere in the fixedness of its characters. The descendant in direct line of a species which flourished in the Tertiary Period in circumpolar Arctic regions, and which later was widely distributed through the northern hemisphere, it has been affected less during the existing geological era by the surroundings of its home in the three continents than other widely distributed trees; and the Chestnut-tree of North America, the Chestnut-tree of the mountains of the Mediterranean Basin and of the Caucasus, and the Chestnut-tree of Japan, are so nearly identical in all the characters which distinguish one species from another that they may be regarded as the same tree. Other trees of similar ancestry, and especially its nearest botanical relative, the Oak, have varied more or less as their surroundings have favored the development of varied forms, and now the Oaks, the Elms, the Walnuts, the Poplars, the Willows, and the other trees peculiar to the northern hemisphere, have all adapted themselves, by the slow development of new forms, to support the altered conditions which have accompanied the topographical and climatic changes to which the earth has been subjected.

That the Chestnut-tree did not share with other plants to the same degree the power of adapting itself to the altered conditions in which it was placed through the advent and retreat of the coating of ice which covered so much of the northern hemisphere during the Glacial Period, will account, perhaps, for the comparatively restricted area which the genus now occupies and the paucity of its forms.

In North America the Chestnut-tree is confined to the Appalachian region, reaching the coast of New England and the middle states and the northern shores of Lake Ontario; it does not extend into the Florida-peninsula or extend west beyond the hilly region of middle Kentucky and Tennessee. There occurs, however, in North America, where it is endemic, the second species of the genus. This is the Chinquapin (*Castanea pumila*), which has a wider range than the true Chestnut has on this continent, although it does not grow naturally north of Pennsylvania. It extends, however, into Florida and west of the Mississippi River,

where it attains its greatest development. Remnants of what is believed to have been the ancestor of this second species of Chestnut have been recognized in the Tertiary formation of Alaska.

The Chestnut has been so generally cultivated in Europe for centuries that it is not easy to determine how much of its actual distribution there is due to the immediate action of man. It was at one time supposed that the home of the Old World Chestnut was confined to the trans-Caspian regions, and that the Greeks and then the Romans had carried it into Europe. There is reason to suppose, however, that the forests of this tree which cover here and there the mountain ranges from Portugal to the Caspian represent an indigenous growth, a view which would seem to be strengthened by the fact that such forests exist also on some of the mountains of Algeria, where it is hardly probable that the Chestnut-tree was ever cultivated to the extent which the entire naturalization of the species would imply. The Chestnut is common in central Europe as far north as Britain; but it is reasonably certain that it was carried there by man in comparatively recent times. West of the Caucasus there is a long stretch where the Chestnut-tree has not secured a foothold. It is not found in the forests of the Himalaya or in China, although it is more than probable that further investigation of the flora of the mountain regions of the western part of the empire will bring to light the presence of forests of Chestnut-trees similar to those which occur in Japan.

The Chestnut for centuries has been one of the most valuable food-producing trees of Europe, and the most careful attention has been paid in Italy and France to developing the size and improving the quality of the fruit. The Romans, in Pliny's time, distinguished eight varieties of chestnuts, and now the number of recognized varieties is very large. The cultivated chestnuts are divided into two classes, known in France as Marrons and Chataignes, the latter bearing about the same relation to the former as the crab-apple does to the apple. Marrons are larger, more farinaceous, and much sweeter and more aromatic than the ordinary chestnut, and are the result of careful selection and cultivation, which has been going on for centuries. Marrons of the best quality are produced in central and southern France, although it is in Italy that the chestnut is more used as an article of food than in other parts of the world.

The Chestnut must be considered one of the most important North American deciduous trees, although several others grow over a much larger area and some of them attain to larger dimensions and produce more valuable timber. The Chestnut-tree, however, grows in America to a respectable size, and specimens often occur on the slopes of the southern Alleghany Mountains with trunks four or five feet in diameter. It is never, however, a very tall tree here, rarely attaining the height of a hundred feet. The trunk is generally short, dividing at a distance of twenty or thirty feet from the ground into stout spreading branches, which form a handsome, compact round head. The habit of the tree is well shown in the illustration on page 359, which represents two characteristic Chestnut-trees, as this tree often appears on the hill-sides of New England.

The fruit of the American Chestnut is small, but very sweet, and it shows a tendency to vary considerably in size and quality, showing that time and care only are needed to produce varieties which will equal in value the best Marrons of France. The production here of the best varieties of chestnuts, however, can be obtained much more quickly by the introduction into the country of European varieties than by the slow process of selecting and developing the native fruit. The European Chestnut, to be sure, is not perfectly hardy in the northern parts of the country, but it flourishes, however, and produces its fruit in the middle and southern states. The population of North America is still too scanty and food is too abundant here to make the cultivation of the Chestnut-tree on any large scale a practical undertaking at present; but the time

will come when the mountain-sides of all the Alleghany region, from Pennsylvania to Georgia, will find their most profitable employment in the production of chestnuts for food. There is no part of the world which is better suited for the purpose, or one in which the Chestnut-tree flourishes with greater luxuriance.

The Chestnut-tree, too, produces wood of great value. Chestnut is one of the American woods best able to withstand the effects of decay when placed in the ground. This makes it one of the best woods for fence-posts, and it has no superior for railroad-ties, for which purpose, especially in New England, it is largely used. It is also used sometimes in cabinet-making. The coarse grain and large open ducts peculiar to this wood unfit it, however, for this purpose, and it is now less generally used than it was formerly in this way or in the construction of dwellings.

The value of the Chestnut as a timber-tree is increased by the fact that the stumps of cut trees have unusual power of producing shoots which soon form trunks large enough for posts and railway-ties, so that a forest of Chestnut-trees may be cut over every thirty or forty years and continue productive during several generations. The American Chestnut possesses a great deal of value as an ornamental tree. It grows rapidly even in light, porous drift, and soon makes a handsome round-headed specimen. It is very beautiful when it is covered early in July with its showy yellow flowers, whose odor some people find, however, extremely disagreeable. Few insects prey upon its handsome glossy foliage, and the fruit, which grows and ripens in the short period of about two months and a half, possesses, even in its unimproved condition, considerable money value.

THE Census of this year naturally suggests the subject of the increasing density of population in this country, and it is encouraging to see any disposition to recognize and consider difficulties and problems which may arise from this source. Until very recently the people of this country have been unwilling to admit the necessity of foresight or self-restraint in any direction. Wastefulness has been regarded as an indication of broad and generous qualities, and it has become a prominent feature in the national character. All our possessions have been considered inexhaustible and have been treated accordingly. We have slaughtered and devastated whatever belonged to the nation, our soil, forests, fish and game, out of mere wanton destructiveness and folly worse than barbaric.

We shall reap what we have sown. When forest-conditions are destroyed on mountains and hills, and the soil has been swept away in consequence, it can never be restored. We live in a world where means and conditions are necessary for the production of results, and we might as well at once begin to depend upon calling our food out of the air by magic as to expect that an unlimited population will be able to obtain the means of subsistence from soil of which the fertility is steadily diminishing.

A recent writer says that the point of the whole matter is that the children of the public schools should be taught the necessity of better cultivation of the land on account of the prospect that in the future population is likely to press upon the means of subsistence. He thinks if this is done we may rest content for the future, because the Anglo-American race has shown itself equal to the solution of all the problems it has ever been called to face. But if the people of this country would begin the practice of such methods of living as are required by the conditions and circumstances of our own time, it would probably have a better effect on the children than any amount of theoretical teaching in the schools. What good will it do to talk to the children about the forestry interests of the future when they see around them every day the prevailing barbarism, the general disregard of the very things which they are told they should attend to when they are grown up? Until our towns begin to treat groves and trees along the roadsides and in other public places in a civilized manner,

until the different states and the nation adopt a policy of intelligence in dealing with public forest-interests, mere talk in the schools about forestry and agriculture would have little value or vitality. We can hardly hope to escape from the obligation to act sensibly and decently ourselves in the present, in our treatment of these great, important matters, by establishing in the schools instruction regarding what should be done in the future. The time for action has already come, and the need for it is pressing. Example is the best teaching. But it is easier to talk about the duty of another generation than to perform our own.

The Preservation of Natural Scenery.

SOME weeks ago we gave an account of a meeting held in Boston to secure the preservation of beautiful and historical places in the state of Massachusetts through a board of trustees empowered to acquire real estate which possesses natural attractiveness and historical interest and to hold this free of taxes for public use. Mr. Charles Eliot added a report upon this proposition, which covered the question so thoroughly that we will do our readers a service by presenting a brief abstract of it. It set out with the assumption that all were agreed upon the value to a crowded community of easily accessible scenes of natural beauty and romantic interest; that cultivated people had none of that selfish feeling which sometimes suggested that it might be preferable to allow a favorite grove or brook-side to be destroyed rather than to help open it to the enjoyment of the "vulgar throng"; that everybody desired to see as many refreshing and interesting spots as possible dedicated to the public enjoyment of our own and future generations. England is strewn with public commons and public forests which are the remnants of ancient royal hunting parks. Moreover, public foot-paths everywhere lead across private land, and many of the grandly wooded estates of the country are open to all who care to enter. Every town has some attractive place of common assemblage, such as the river banks at Lincoln or Durham, the castle grounds at Ludlow or the city walls in Chester. In short, no such problem confronts the people of England as that which faces the men of Massachusetts. Even the French Republic maintains public forests and the once imperial gardens and palaces with a care which is hardly excelled in imperial Germany. New England once possessed considerable commons, but they have long since been appropriated to private use.

There is a Public Forest Act which may help to secure large tracts of land for the enjoyment of the people, as it already has done in the city of Lynn, where a wilderness of 1,500 acres has been converted into a Commonwood, and under this act it is hoped that the towns which surround the Middlesex Fells may secure as large a tract as the Lynn Public Forest. But no easy way exists at present by which small bits of natural scenery and single buildings or sites of uncommon interest can be dedicated to public use. These places might be taken by towns under the Park Act, but the government of a Yankee town is not always adapted to the maintenance of trusts which require good taste and permanent policy. The desired result could be reached by a special act of the Legislature as was done in the case of the old South Church in Boston and by the inhabitants of Cazenovia, New York, in order to secure the gorge and falls of the Chittenango. But the necessity for special laws and the organization of special boards discourage and hinder those who have this cause at heart, and, therefore, the plan of a single board of trustees for the whole state was proposed by the committee.

Scattered throughout the state are thriving historical and antiquarian societies and other associations which have already saved some memorable places. The Essex Institute has purchased a great boulder called the Ship Rock. The Old Colony Natural History Society owns Dighton Rock and the Worcester Natural History Society owns part of the shore of Lake Quinsigamond. If these societies, with all other individuals who may be interested, should make appeal to the Legislature to establish one strong board of trustees, this concerted action would probably bring about the creation of the board; and the existence and action of this board would in turn stimulate local effort for the acquisition of desirable lands. On a similar plan some of the noblest institutions of the state have been maintained, like the Massachusetts General Hospital and the Boston Museum of Fine Arts. It may be asked whether the value of natural beauty and historical memorials is sufficiently understood in the state to encourage gifts of such a character to the trustees. The value of a hospital is recognized, but is the same true of the love of nature and of the historical past? This ques-

tion can only be answered by experiment and the committee have no doubt of the result.

It is encouraging to recall the fact that what is now desired to be accomplished throughout the state by a central board of trustees has already been gained in a suburb of Boston by the Board of Trustees of Harvard University. This board once acquired, by gift from Benjamin Bussey, a large tract of farm and wood land in Roxbury. By virtue of their charter, the Harvard trustees hold this land free of taxes; and when, in pursuance of the will of James Arnold, they established on a part of it a collection of all the trees and shrubs which will live in this climate, they made with the city of Boston the same bargain which it is now proposed to enable the suggested board of trustees to make with any town or city in the state. Harvard University opens the Arnold Arboretum to the public in return for police protection and the making of roads and paths.

Unripe Seed.

AT this season of the year it may be desirable to call attention to some past work done at the New York Agricultural Experiment Station, which seems to have been strangely overlooked, important as it may be in furnishing clues and suggestions toward a method of attaining earliness and other changes in our cultivated vegetables. Last summer Professor Arthur, of Purdue University, gave me an oral account of the great success attained in earliness from the use of Tomato seed from the strain originated at Geneva from unripe seed, a strain for which we had many applications from practical growers; and perhaps Professor Goff may be induced to give to the public the results of his continuous work in this field.

In 1883 it was found that Flint Corn, Sweet Corn and Dent Corn, harvested before glazing, germinated freely, and that Peas planted while at the edible stage vegetated freely. (Report of 1883, 39.)

In 1884 ripe and unripe seeds of the Early Dutch Turnip were planted. Fifteen roots from the green seeds weighed on the average four and a half ounces each; thirty-four roots from the ripe seed averaged six ounces each. (Report of 1884, 199.)

Very green seeds of Cook's Favorite Tomato yielded ripe fruit in 126 days from planting; ripe seed yielded ripe fruit in 146 days from planting. The first ten ripe fruits were gathered in 137 days from the green-seed plants; in 152 days from the ripest-seed plants. For additional particulars the reference may be consulted. (Report of 1884, 224.)

Trials were made with three varieties of Peas. The first pods were ripe in the Blue Peter in sixty-eight days from both the ripe and unripe seed; in the case of the Eugenia in seventy-seven days from ripe seed, in seventy-two days from green seed; in the case of William the First in sixty-five days from the ripe seed, in eighty-four days from green seed. The number of pods per 100 plants varied from 629 to 467 between the plants of Blue Peter from ripe and those from green seed; from 706 to 677 for the Eugenia; from 300 to 1,600 for William the First. (Report of 1884, 232.)

In 1885 green seed gave heads of Danish Drumhead Cabbage ninety-seven ounces in weight; ripe seed seventy-five ounces. (Report of 1885, 154.) In Lettuce no difference was observed between green and ripe seed.

In the Tomato, a gain for the first ten fruits of a week was noted in favor of immature seed, in one case, and with another variety unripe seed produced fruit considerably earlier.

These references should be enough to turn attention to the experiments. The best results were with the Tomato. Here a gain of fifteen or twenty days in earliness was obtained, and this gain, as Professor Arthur tells me, has been maintained to date. A weakness in the plants has been a serious drawback, and while green seed seemed unfitted for immediate use by the grower, yet it is by no means certain but that this feebleness may be trained out by the experimenter. The trials were too few to attain certainty, but the great value to marketmen of an early strain of seed ought to encourage further tests. Why should not our experiment stations enter upon this interesting and promising inquiry?

South Framingham, Mass.

E. Lewis Sturtevant.

Is the Strawberry Improving?

THE history of the cultivated Strawberry, though short as compared with that of most of our fruits, is of especial interest as bearing upon fruit improvement. We have here a fruit that possesses such rare dessert qualities that it is a universal favorite, a fruit of which seedlings are grown with the utmost ease, and come very quickly into bearing, and of which several botanical species hybridize very readily, produc-

ing abundantly fertile offspring. All these facts have tended to concentrate the attention of amateur horticulturists upon the Strawberry, and it is not improbable that more seedlings of this fruit have been grown during the last half century than of all other fruits combined.

What has been the result? Has the Strawberry shown a continuous improvement during this period? Hovey's Seedling was introduced about 1834, and through its sterling merit soon became a standard. The last report of the American Pomological Society shows that this old favorite is still grown in sixteen states, and in only eight of the fifty-three tabulated varieties is it excelled in the number of its stars. The first supplanter of Hovey's Seedling in public estimation was the Wilson, of which the date of introduction seems to be lost. From the report just cited it appears that this variety is still grown in thirty-eight states, and the number of its stars surpasses that of the next highest by nearly 100 per cent. In 1872 Downing described 260 varieties of Strawberries, of which only eight were named in the last report of the American Pomological Society. The question which naturally follows is: Have any varieties developed since the last meeting of the American Pomological Society that are likely to surpass the Wilson in public esteem? It is true that this old standard is suffering seriously from disease in many localities, but where maintained free from disease it certainly has not yet been supplanted. Unwilling as we may be to admit it, these cold facts declare that since the appearance of the Wilson not one of the millions of seedlings that have been grown has surpassed it in excellence, all points considered.

Do these facts imply that further attempts at improving the Strawberry are useless? Not necessarily. It is much to be regretted that we do not know more of the history of our cultivated Strawberry. The common opinion of horticulturists and botanists appears to be that it is the result of a hybrid between our native *Fragaria Virginiana* and the *F. grandiflora* of South America. But by whom the importations of the latter were made or by whom the hybridizations were effected is not definitely known. If all the amateur Strawberry work of the past half century has been confined to the posterity of one or a few hybridizations between the two parental species, it is not strange if the limits of variation have been reached. Unless we accept the hypothesis that hybridization tends to reproduce all past variations within the parental families, it is possible that by securing new hybrids between the species that are the parents of our cultivated Strawberry, selecting specimens that show marked characteristics, the scope of variation might be very much extended. It is hardly probable that the original parents were selected with any great degree of care or wisdom, but the results have proved infinitely valuable. Possibly a more careful selection of parental types might give rise to much greater improvements.

The importance that the Strawberry has assumed as a commercial fruit is certainly sufficient to warrant a systematic series of experiments looking toward its further improvement, and in these days of experiment stations, why should not this be undertaken?

University of Wisconsin, Madison.

E. S. Goff.

Notes on North American Trees.—XX.

Description of the Wood of Certain Species.

Terminalia Buceras. Wood exceedingly heavy and hard, compact and close-grained, containing numerous minute evenly distributed open ducts; layers of annual growth hardly distinguishable; medullary rays thin, very obscure; color light yellow-brown, sometimes slightly streaked with orange, the sap-wood clear pale yellow; specific gravity, 1.0490, 1.0322, average 1.0406; ash, 4.93, 4.84, average 4.89; weight per cubic foot, 64.85 pounds; fuel value, 0.9868. Collected by A. H. Curtiss and C. S. Sargent on Elliott's Key, Florida.

Quercus tomentella. Wood heavy, hard, close-grained, compact, satiny, containing broad bands of open ducts parallel with the broad, conspicuous medullary rays; color pale yellow-brown, that of the sap-wood rather lighter; specific gravity, 0.7187, 0.7240, average 0.7214; ash, 1.10, 0.90, average 1.00; weight per cubic foot, 44.95 pounds; fuel value, 0.7142.

Cupressus MacNabiana. Wood light, soft, very close-grained, compact, bands of small summer cells narrow, dark colored, conspicuous; medullary rays thin, obscure; color light brown, the sap-wood nearly white; specific

gravity 0.5503, 0.5647, average 0.5575; ash 0.61, 0.65, average, 0.63; weight per cubic foot, 34.74 pounds; fuel value, 0.5540. Collected by T. S. Brandegee in Lake County, California.

Picea Breweriana. Wood much heavier than that of the other North American species, soft, close-grained, compact, satiny; bands of small summer cells broad and conspicuous, resin passages broad, widely scattered, conspicuous; medullary rays thin, numerous; color very light brown or nearly white, the sap-wood hardly distinguishable; specific gravity, 0.5179, 0.5103, average 0.5141; ash, 0.44, 0.53, average 0.49; weight per cubic foot, 32.04 pounds; fuel value, 0.5116. Collected by T. S. Brandegee on the Siskiyou Mountains, Oregon.

Larix Lyallii. Wood heavy, hard, close-grained, compact, susceptible of a fine polish; bands of small summer cells broad, occupying from a third to a half of the layers of annual growth, very resinous, dark colored, conspicuous; resin passages few, obscure; medullary rays numerous, thin; color bright reddish brown, that of the sap-wood nearly white; specific gravity, 0.6785, 0.7369, average 0.7077; ash, 0.30, 0.25, average 0.28; weight per cubic foot, 44.10 pounds; fuel value, 0.7057. Collected by T. S. Brandegee in Washington Territory.

The wood of this species is intermediate in weight between that of the eastern Larch (*L. laricina*) and that of the western Larch (*L. occidentalis*), which surpasses in weight and strength the wood of any North American coniferous tree.

Sabal species. Wood exceedingly light, soft, fibro-vascular bundles broad, light colored, not very conspicuous; color light brown, tinged with red; specific gravity, 0.2679, 0.2534, average 0.2607; ash, 3.74, 3.63, average 3.68; weight per cubic foot, 16.25 pounds; fuel value, 0.2511; used for piles, wharves, etc. Collected by C. G. Pringle near the mouth of the Rio Grande in Texas.

C. S. Sargent.

New or Little Known Plants.

Æsculus Parryi.*

A DWARF Horse-chestnut detected on the shores of Todos-Santos Bay in April, 1882, by a party of botanists consisting of the late Dr. C. C. Parry, Mr. C. G. Pringle and Mr. Marcus E. Jones, was described under this name by Professor Asa Gray in the *Proceedings of the American Academy of Arts and Sciences* (xvii., 200). He pointed out the affinities of the plant, a low shrub, with the familiar Buckeye of California, which in many respects it closely resembles. The chief differences are found in the character of the calyx, which in *Æsculus Californica* is deeply two-lobed, the lobes being very slightly divided, while in *Æsculus Parryi* the campanulate calyx has five nearly equal lobes. These characters are constant in all the species I have examined, and I fail to find any intermediate form which would serve to connect the plant of Lower California with the California Buckeye, from which it differs also in its shorter inflorescence, its shorter pedicels, smaller flowers and fruit, and in the dense pubescence which covers the under surface of the small obovate leaflets, which are sessile, or generally nearly so. The fruit is unarmed, obovate, rather less than an inch long and broad, in the specimens I have seen, which are from one to three-seeded. The seed is a third of an inch in diameter.

This interesting plant (see page 357) has not been introduced yet into cultivation.

C. S. S.

The California Pæonias.

OUR continent seems to be popularly credited with only a single native species of Pæonia. In one of several valuable paragraphs on the genus by Mr. Watson, of London, published in a recent issue of GARDEN AND FOREST, I read the following in relation to America: "In the latter country *P. Brownii* is the only species that occurs wild."

* "ÆSCULUS PARRYI.—Æ. Californicæ affinis, frutex humilis; foliis 3-5-foliolatis; foliolis obovatis obtusis subcoriaceis brevissime petiolulatis subtus cano-tomentosis; floribus brevipedicellatis; calyce campanulato ad medium usque æqualiter 5-fido petalisque extus tomentosis; filamentis validioribus minus exsertis."

The truth is, that we have two easily distinguishable species, both belonging to the Pacific slope of the continent, and both found within the limits of the extensive commonwealth of California, although inhabiting each its own peculiar climatic region, neither one intruding upon or even nearly approaching the territory of the other species. Neither one is of recent discovery; but in the herbaria of eastern America, as well as in those of Europe, if both species occur, authors have apparently confounded them. The names of the two, as well as their distinguishing marks, may be given thus:

Pæonia Brownii, Dougl. (Hook., Fl. Br. Am., i. 27.) Herbage glabrous and glaucous; leaves of ovate general outline, ternately divided into many short obtuse segments.

Pæonia Californica, Nutt. (Torr. & Gray, Fl., i. 41.) Glabrous, but not glaucous; leaves twice or thrice as large, of rounded and pedate general outline—i. e., broader than long, divided into few lanceolate or oblong-acute segments.

P. Brownii inhabits the subalpine regions of the snowy mountains, from middle California northward through Oregon and Washington, flowering in June and July, often near banks of melting snow.

P. Californica, at its northern limit, is separated by 200 or 300 miles at least from the nearest habitat of its congener, flourishing in a climate almost as different as possible. It belongs to the hill country of southern and sub-tropical California near the sea, where snow never falls and where its shoots appear above ground and push into bloom soon after the first of the late autumnal rains.

From some of the specimens in my herbarium I suspect these plants will prove further distinguishable by different subterranean characters. While the vegetating shoots of *P. Californica* seem to arise immediately from the midst of a fascicle of (tuberous?) roots not deeply seated in the ground, those of *P. Brownii* are attached to the summit of a thick, somewhat ligneous root-stock, which may or may not be found to connect with a deep-seated fascicle of roots. Since the time when I learned to distinguish the two species at a glance in even the poorest herbarium specimens, I have had no opportunity to take up the subject of their vegetative characters. Neither species is in cultivation anywhere so far as I know, and my location is midway between the respective habitats of the two, and far from that of either one. The flowers of both are small, of a dark dull red, without beauty; but the botanical interest of these species should make them desirable wherever the genus is extensively cultivated, whether for botanical or horticultural purposes, though botany and horticulture ought to go more hand-in-hand than they have done.

University of California.

Edward L. Greene.

Foreign Correspondence.

Botanical Gardens at Birmingham.

IN some of the most important of English provincial towns there are pleasure gardens called botanical gardens, for which a price of admission is charged and where a more or less interesting collection of plants is included amongst the attractions of the place. These attractions may vary from a brass band to a company of performing minstrels or a bicycle match. As a rule, the collection of plants scarcely justifies the title of the gardens, and in some there are as few evidences of good horticulture as of botany.

The botanical gardens at Birmingham are, however, a striking exception—the plants, both in-doors and out, being particularly good, both in regard to their variety and cultivation. The gardens are small, occupying only about twelve acres, but their position is a well chosen one. They are on the side of a slope, commanding a view of beautifully wooded country. "On the right is to be seen the village of Harborne, backed by the Warley Woods, and on the left the eye follows the little valley of the Bourn, and beyond are the hills of Bromsgrove Lickey. Harborne was long the residence of David Cox, the painter, but it is strangely altered since the time when he was laid to rest under the Elms in the old church-yard."

The plan of the gardens was prepared by J. C. Loudon, and they were opened to the public about sixty years ago, under the auspices of the Botanical and Horticultural Society of the town. There is a charge for admission, and a string band performs in the afternoons during the summer.

A students' garden is one of the features of the place, where the plants are arranged in their natural orders for the convenience of the students of Mason College, in the town, and others. A similar garden has long been provided at Kew. Students are allowed to gather specimens of any of the plants they wish to examine or preserve. This arrangement is greatly

appreciated by hundreds of those who visit Kew for purposes of study.

Amongst the most striking of the plants noticed by me recently, when looking over the gardens at Birmingham, the following deserve special mention :

Tree Ferns are well represented, and comprise some unique

luxuriance are generally treated as stove or intermediate species. There are *Cyathea princeps*, *C. spectabilis*, *C. funebris* and *C. medullaris* represented by tall-stemmed, large-headed specimens. Cibotiums were equally striking; as were *Alsophila excelsa*, with a stem fifteen feet high ; *A. australis*, twenty feet high ; *Lomaria gibba*, *Dicksonia squarrosa*, a pair, twenty feet



Fig. 47.—*Esculus Parryi*.—See page 356.

examples of rare species. They are grown in a tall octagonal house along with Camellias, Lapagerias and other typical greenhouse plants. I mention this fact as conclusive evidence that the Ferns receive ordinary greenhouse treatment all the year round. In winter the temperature frequently falls to forty degrees Fahr. Unless I am very much mistaken some of the Ferns which are growing in this house in perfect health and

high ; *D. antarctica* and *D. Lathamii*. This last is supposed to be a hybrid between *D. antarctica* and the rare *D. arborescens*, a native of St. Helena. Mr. Latham, the curator of the gardens, raised this plant from spores at a time when he had growing together the two species from which it is supposed to have originated. It is a very distinct Tree Fern, quite unlike any other known in gardens. The stem is seven

feet high, two feet through at the base, and it bears an enormous head of fronds, each about twelve feet long, with large, leathery gray-green pinnules. The base of the rachis is clothed with long silky scale-hairs of a deep golden brown color, a character which led to the plant's being mistaken for *D. chrysotricha*. Young plants show an equally well marked individuality. It is becoming quite evident, to me at any rate, that a large number of Ferns, and especially arborescent Ferns, are cultivated in much warmer houses than they require or even than is good for them. The finest collection of Tree Ferns is probably that in the Brussels Botanical Gardens, where species from all parts, temperate as well as tropical, are cultivated in a large house wherein the conditions are those of a warm greenhouse rather than a stove.

A fine glass structure about 100 feet long by forty feet wide, and about twenty feet high, is used as a promenade and exhibition hall, at Birmingham. Stages run all round the sides, and these are filled with plants, chiefly ornamental, whilst from the roof hang creepers of various kinds. A band stand at one end of the structure is partly hidden by a group of Palms, Musas and other fine leaved plants. The entire range of the stages along one side of this house was at the time of my visit filled with a collection of Fuchsias, some of them trained a little way up the roof, others hanging gracefully over. The effect was particularly good—an irregular wall of masses of flowers all hanging elegantly as Fuchsias only do hang. In addition to such fine varieties as Golden Avalanche, Mrs. Marshall, Earl of Beaconsfield, Mrs. G. Rundell and Monarch, such handsome species as *F. corymbosa* and *F. arborea* were conspicuous. In another house were some beautifully grown examples of *F. triphylla*, the pretty Mexican species which was brought into notice by Kew some six years ago. It is the species upon which the genus was founded, but so little was known of it that botanists began to suspect that the type of the genus was not a Fuchsia at all! Mr. Latham obtained a plant of it from Kew, as also did many others, but whilst they and Kew have been struggling with the plant in a greenhouse and grown it but poorly, here at Birmingham it has grown very freely, forming perfect specimens two feet through and profusely covered with large clusters of its bright scarlet, long-tubed flowers. The secret of Mr. Latham's success with this plant is stove instead of greenhouse treatment.

Mitraria coccinea is grown well as a wall plant in a lofty greenhouse. The brilliant color and elegant form of the flowers of this easily grown plant merit better recognition for it than it receives at present. It is grown in pots at Kew and forms handsome specimens.

Clerodendron fallax is exceptionally well managed at Birmingham. As a rule it is straggly and thin in habit, but here it is fully a yard through, thickly clothed with large dark green leaves, whilst each of the eight or ten branches bears a head eight inches through of bright scarlet flowers. The plants continue in bloom at least two months. At Kew there is a white-flowered variety (*C. fallax alba*) of this fine old-fashioned stove plant.

The collection of Orchids comprises not a few choice and rare kinds amongst a fairly comprehensive lot of popular garden sorts. Instead of growing them in houses by themselves, Mr. Latham mixes them with miscellaneous flowering plants and Ferns, an arrangement which enhances the beauty of the Orchid flowers and improves the appearance of the plants.

Callicarpa purpurea is splendidly grown by Mr. Latham. Whilst it is hardy enough to grow in a cold greenhouse, this shrub is never seen at its best unless when grown in heat. At Birmingham it occupies the central stage of a house where Gloxinias, *Aristolochia elegans* and *Hoya globulosa* are at home, the *Callicarpa* forming shrubs six feet through with branches fully four feet long, leafy from base to point, and with a cluster of flowers or small berries in every leaf axil. In autumn the berries will be about the size of Peas and colored bright magenta.

Platycerium Stemmaria is a very striking Fern when grown well, as it is at Birmingham, where some large examples occupy a portion of a house devoted to choice Aroids, Crotons, Dracænas, etc. In the greenhouse, along with the Camellias are two enormous masses of *P. alcicorne*. Apparently this species is perfectly happy in a greenhouse. *Ouvirandra*, *Nymphæas*, *Todæas* and other Filmy Ferns, *Stapelias*, Cacti and some of the most important of economic plants are also in this collection. Altogether the Botanical Gardens of Birmingham must play a not unimportant part in the education of the people of the town, as well as affording a very pleasant resort for leisured people at all times of the year.

Birmingham, Eng.

Visitor.

Cultural Department.

The Endurance of Orchards.

IT is a very common remark that our modern orchards do not live so long as the orchards of our fathers and grandfathers. There is truth in the statement. Those old orchards were usually seedling trees, picked up in the fence corners, planted in sod, sparingly pruned, slow to come into bearing, and to a very large extent ungrafted, and producing little other than cider apples. I was reared in a ten-acre orchard of this sort, and having followed fruit-growing nearly ever since, I think I can explain why our modern orchards are shorter lived than those of our forefathers.

Those old seedling trees, picked up wherever the scattered seeds found a hospitable spot, were rarely transplanted to the orchard until six or seven feet high—which means at least as many years of age. Set out in sod, they re-established themselves slowly and grew slowly, so that few of these orchards came to full bearing in much less than twenty years. In those days there was little market even for good fruit, and but few trees were grafted with the better kinds in cultivation—hardly more than enough for home use. Cider and cider brandy were the objects sought by the orchardist then.

The old-time orchardist was not a skillful pruner; his implement was the axe; but he only pruned to get rid of limbs that were in his way. Land was cheap and the trees were allowed plenty of room. The soil was fresh and they grew thriftily—such wounds as they received healing quickly. Selection had given only the most vigorous of the abundant seedlings a place in the orchard, while the winters had sufficient time, before these were transplanted, to winnow out the weaklings. So the old orchards, started with strong trees, in good soil and widely spaced, grew up with but slight pruning under the very best conditions for a long existence.

Contrast all this with our present method of planting an orchard. Beginning with two or three-year-old trees from a highly enriched nursery, we find nearly all but the few skilled professional orchardists planting these trees in the grass, as of old. The papers are full of advice about pruning fruit-trees, and the jack-knife and saw are allowed free play on these younglings before they have got fairly to growing. The injury in cutting a tree is in direct proportion to the amount of wood removed, relatively to what is left, and it too often happens that the ignorant pruner administers a life-long check to his tree in the first years of its life. Such a tree struggles along feebly, it may be for many years, but at last dies without ever yielding any profit to the planter.

On the other hand, it may be that the would-be orchardist sets his trees in an enriched piece of tilled land. This is right, if his selection of varieties is right. But the ease with which trees can be had from a distance, and the persistence with which new varieties are pressed upon the public, too often lead to a heterogeneous collection of sorts, few of them well suited to the place in which they find themselves. There are very few cosmopolitan Apples. Many sorts are very local, and however fine or profitable in the right spot they are unthrifty in every other. The old orchards were native to the spot and their trees were well winnowed by the seasons before they were admitted to cultivation.

We must admit that the old orchards were vigorous and long lived, and for the times and uses when and for which they were planted, they were profitable. A modified form of the old method still continues in many places. Most of the commercial orchards of Maine are grafted upon seedlings selected and set out as above detailed, and the practice is not confined to Maine. It is in many places, especially in the north, better than purchasing from nurseries, because the stocks are tested for hardiness before the grafting is done. Many of our best market Apples are too tender in Maine to be profitable, unless top-worked upon stocks more hardy than themselves.

This brings one to another reason why orchards in many places, though productive for a while, are not enduring. These orchards consist of sorts not quite hardy enough for the spot where they grow. Top-worked upon native seedlings, they do well for a while; but severe test winters, in conjunction with heavy crops of fruit as they come into full bearing, weaken the vitality of the grafts; and with a hard winter, immediately following a large yield of fruit, the orchard is found in a bad, and often an irrecoverable condition. There is nothing in such a result that should be unexpected to an intelligent cultivator. If he wants a long-lived orchard he must plant only such long-lived varieties as are quite capable of enduring the severest extremes of the locality. But I believe it will often pay sufficiently well to practice the other method, though



Typical New England Chestnut-Trees.—See page 358.

inevitable risks attend it. The orchardists of south-western Maine grow such valuable commercial apples as the Baldwin, the Rhode Island Greening, the Roxbury Russet and the Gravenstein successfully only when top-worked upon hardy native stocks. Handy to Portland and to Boston, these growers have easy access to the best home and foreign markets with their apples, which, when well grown and properly handled, have a quick and sure sale at a high price. Their trees will not be long-lived, but they will live long enough to yield a handsome profit; and as they rarely die all at one time, the orchard can be kept up by replanting, or by successive plantings, so as to make the business continuous. Such orchards, short-lived though they may be, are very much more profitable than their long-lived predecessors. We can still have long-lived orchards by reverting to old methods. In changing from them we have not effected any change in Nature. She will still give us all that she gave our fathers if we will comply with her conditions.

Newport, Vt.

T. H. Hoskins.

Our Currants.

THE currant crop should be one of our largest. The market is always good. The demand is never met by the supply. I never fail to obtain eight cents a pound, and this year have marketed all my crop at ten cents. The fruit pays at five cents a pound. The bushes need strong, moist, but not wet, soil. They should be kept clean and in a high state of culture, but they like partial shade. I grow them in the same rows with red Raspberries, alternating the bushes.

The varieties best for market are Versailles and Fay. There is little difference between these, and the preference is for Versailles. This Currant is not easily obtained—that is, the genuine. It is magnificent in bush and bunch. Why Fay ever secured such applause as superior to all others is a wonder. It is hardly distinguishable from the Versailles. The Cherry has a short bunch, some years very short. It is also a comparatively poor cropper, and is not well flavored. The sweetest currant is White Dutch; but when not very well grown it is over seedy and small. White Grape is the first of all currants for the table. It is thin-skinned, not over seedy, large, handsome, with superb bunches, a great cropper, and delicious in flavor.

The currant has the advantage of hanging on the bushes for several weeks, and is in order for the table for at least two months. One should have a few bushes of Prince Albert to lengthen out the season. Of course, if worms are allowed to defoliate the plants, the crop must be gathered very early and used for jelly, or it will sun-burn and sour.

The Crandall is not what it was sold for—a cross of native with foreign sorts. It is a pure native, somewhat improved. But it is half a humbug, after all. The bush lops about, and must be tied to stakes. The size of the currant is only that of a large fruit of the ornamental Missouri Currant grown in our shrubberies. The flavor is pleasant, but no improvement on that of the varieties grown for ornament. Let it be taken for what it is, and appreciated accordingly.

The propagation of the Currant is very easy. Take cuttings a foot length; set these into the soil in a dry place in October or November. Pack down the dirt very tightly and leave them until spring. Then a part will be found to have rooted, while the rest will have calloused and are ready for planting if you desire. In setting such small plants pack the earth very tightly about them. It is the secret of success.

The only enemy the Currant has generally is the well known worm that defoliates the plant. White hellebore dusted on will kill them. The best method of applying is to mix two tablespoonfuls of hellebore in a pail of water with one teaspoonful of kerosene. Riley's emulsion of kerosene is easily made and kept on hand. It is the best way of using it. I apply exactly the same mixture to Rose-slugs. Two generations of worms appear each season, and both must be killed. One of them hatches as the fruit is setting; the other as it is ripening. The hellebore should be applied the last time without kerosene, as it is sticky and helps dust to adhere to the fruit.

Clinton, N. Y.

E. P. Powell.

The Water Garden.

PERHAPS none of our wild flowers are more universally appreciated than the Water Lilies, and yet until one has cultivated Nymphæas and has had an opportunity to study them day by day their full beauty is scarcely appreciated; for this is a flower which appears at its best when daintily anchored in a clear pool. It cannot be too often said that in this climate all the Nymphæas and Nelumbiums can be successfully

grown in the open air without the aid of glass, and, with the exception of *Victoria regia*, no large estate is necessary, for room may be made in almost any small garden, if it is sunny, for a tank, which, with a little management, may be made a successful water garden.

Last year I noted in GARDEN AND FOREST (ii., page 405) an experiment in growing Nymphæas in sunken casks, which answered very well, but this season the natural result is a tank, which, while simply made and inexpensive, quite answers its purpose. An ordinary laborer dug an irregular pit about two feet deep, with slightly sloping sides, and after firming the bottom applied a coating of pure Portland cement, going over it twice, which made it water-tight. Even in light soils, I think a good coating of cement would answer without brick-work. It is well to apply this when the earth is dry, as otherwise cracks may appear in a very dry season. Of course, where permanence is desired, and the expense can be afforded, a tank with brick walls would be best. In as small a tank as mine (ten by twelve feet) it is requisite that there shall be an overflow and a convenient supply of fresh water, also that surface water shall not be allowed to flow into it. The water can be syphoned through the overflow if it be necessary at any time to draw it all off.

When first planted the large amount of manure used will somewhat foul the water, and there will be some rising of impurities, which should be floated out through the overflow; but the water will soon clear, and if the tank is well stocked with gold-fish, silver-fish or sun-fish, there should be no further trouble from impurities, mosquito-germs or algæ. Should it be desirable to hasten the settlement of any accidental turbidity, a spray of a very weak solution of alum would soon cause precipitation.

If the plants used are hardy and few it is as well to plant them out, but if rather numerous it will be more convenient to plant them in boxes or baskets. They are gross feeders and rank growers, and for a small tank it will be better to give only moderate root-room. Of course, one does not in this way secure the greatest development of foliage and flowers, but this is not essential to one's enjoyment always. If æsthetic considerations alone prevailed, a tank the size of mine would be well furnished with, say, two Nymphæas and a Nelumbium; but it is possible to grow a dozen varieties, and also find room for *Papyrus Antiquorum*, varieties of *Sagittaria*, *Alisma*, *Aponogeton distachyon*, *Eichornia crassipes*, *Limncharis Humboldtii*, etc., all of which are interesting and quite indispensable.

A flower-lover must feel in sympathy sometimes with M. Alphonse Karr's Tulip-amateur, who desired a chair that he might sit down and be alone with his favorite flower. No other spot in the garden so strongly suggests a similar longing as does the water garden. On its border in the morning of a summer's day one finds restful enjoyment in the beauty of the foliage, the varied bearing, form and coloring of the flowers, the fascinating water reflecting the changeful sky, the busy fish active as so many children, the frogs enjoying siestas on the Lily-pads—not nearly so sleepy as they seem—and the varied "small deer" which water attracts. And then the setting of the jewel! At one side, flanked by a Bamboo and *Spiræa*, are the flag-like leaves of Kämpfer's Iris, the graceful, quiet flowers being in tone with the surroundings; another side is filled with Cannas, Bamboo and Eulalias, with an undergrowth of Ferns, Primulas, etc. There a jutting point is made by a mass of peat, from which springs a colony of wildlings, and a Dwarf Sumach pendant over the water—a nice bit this. Convenient to the banks I find quiet places where small things, Saxifrages, Primulas, Droseras, etc., are at home in the moist air and the chance of a full supply of water. In an adjacent border I expect to establish an artificial bog connected with the tank, where can be grown many fine things which are troublesome or difficult in an ordinary garden. As will be seen, the accessories of a water-garden are scarcely second in interest to the garden itself, but some care should be used in selecting plants for such a position. The color-tone of the picture is low and quiet, and plants with bright, dazzling flowers should not be used, especially if dwarf-flowering. Cannas nowadays have dazzling flowers, but they are tall and too valuable otherwise to discard for their color. *Caladium esculentum* is also an excellent foliage plant in such a position, but in a small place the buildings give the winds a rotatory motion and the huge leaves are twisted off, so that it can only be grown well in open spaces. The larger Grasses are perhaps the best plants for such a position. Mr. Watson, in his notes from Kew a few weeks since, wrote of "the universal attraction of the aquatic tank," and nothing truer could be said; for it is a remarkable fact that the Lily-pond proves an attraction to every one, young or old, without exception—something which cannot be said of any

other class of plants, however showy or beautiful. Every grower who has been chastened by the average visitor, who, fearing "to be dilated with the wrong emotion," notices only the well known flowers and looks coldly on the unknown treasures, should provide a tank for a certain attraction.

Elizabeth, N. J.

J. N. Gerard.

"The King of Lilies."

I AM not aware that the great Himalayan Lily—*Lilium giganteum*—has been previously grown in the open air in this state; it is a stranger to western New York, I have reason to believe, until this season.

My first experience with this Lily dates back to the autumn of 1885, when several flowering bulbs were sent me from England. The gigantic conical bulbs were potted and housed in a cool house over winter and planted in the open in the spring, only to be cut down and killed by an unexpected sharp frost during early May. The following autumn a dozen small bulbs were sent me by a friend in North Wales. These, likewise, were potted and housed over winter, with the exception of three, which were planted late in November in the hardy fernery. The latter all put forth leaves the following spring, showing conclusively that the species is hardy in this climate. The remaining bulbs were also placed in the fernery and the shaded portion of the rock-garden. Of eight of the dozen bulbs which survived, four have just blossomed, the remaining four being strong plants which, unquestionably, will produce flower stalks next season.

The plants have all received a slight winter protection of leaves; and every spring the early projecting crown has been protected by pots or other covering whenever any danger from frost has appeared, this Lily being one of the very first plants to show above ground in spring and being extremely sensitive to sudden cold. The stem begins its ascent early in the season, throwing out the large heart-shaped leaves, which diminish in size as they advance upon the stem, the flowers forming in a great raceme at the extremity of the stalk. Even as a foliage plant, independent of its stately flower-stalk, this Lily, with its huge, glossy leaves, is strikingly attractive, and the leaves remain fresh and green until mid-autumn.

The strange beauty and majesty of the great Himalayan Lily must be seen, however, to be fully realized; and it is to direct the attention of all flower-lovers to one of the grandest of hardy plants that I am prompted to refer to it. Its beauty could only be fully portrayed by a poet. If any flower may be termed regal, this term applies to *Lilium giganteum*. It looks like the inhabitant of a tropical jungle—a sacred flower of the far east, supreme in its stateliness and its grace. Its suave, haunting odor sets me dreaming. Fragrances as of Jasmines, Japanese Honeysuckles and Gardenias; perfumes as of Cascarilla and Sandal-wood; spices as of Sassafras and Clove-Carnation cling to its long, chaste chalice and scent the entire garden in the evening. Then the cernuous poise of its great flower-cluster, nodding from the tall, tapering stalk above the majestic leaves, and the refinement and beauty of the long, trumpet-shaped blooms! A distinct feature of the six-petaled blossom is the penciling of the inner petals, these being exquisitely shaded with purple merging to deep lake, from the extremity of the flower to the flange of the chalice.

The height of the Bamboo-like stalk in the four specimens referred to varies from eight feet three inches to nine feet, the diameter of the thickest stalk exceeding two and a quarter inches. The flowers number from ten to twelve, while the individual blooms measure from eight to nine inches in length. After flowering, the stalk dies down and the old bulb shrivels and dies. Each bulb has thrown out from two to four offsets, which will be lifted and placed where desired in the autumn.

To obtain success with the "King of Lilies," it should have a sheltered and partially shaded position in rich garden soil and leaf mould, and receive abundance of moisture. An application or two of liquid manure will prove of benefit in developing the flowers. It is seen to advantage placed among the native red and yellow Meadow Lilies, which unfold their gay Turk's caps at the same period. A bed of *Lilium giganteum*, grown by themselves or with *L. auratum*, where the latter can be successfully grown, would be a novel and magnificent feature of any garden, more especially if placed against a background of green.

The last raceme of the last flowering plant now stands in a vase in the hall, and fills the entire house with its subtle, penetrating perfume, the odor being exhaled most intensely at night. The garden looks deserted since these giant Lilies have passed, and no blaze of the big Bee Larkspurs nor gay

rosettes of the ranks of the Hollyhocks serves to take their place. The "King of Lilies" is individual among hardy flowers.

Rochester, N. Y.

George H. Ellwanger.

Orchid Notes.

Catasetum atratum is an old but not very well known species, which has been in cultivation since 1838, when it was introduced from Brazil by Loddiges, of Hackney, with whom it appears to have flowered for the first time in cultivation. It is met with here and there in collections nowadays, and quite recently a splendid specimen of it was exhibited at a meeting of the Royal Horticultural Society, as a proof of what a handsome plant it might be made by good cultivation. Fully developed pseudo-bulbs are from nine to twelve inches long, oblong-conical in shape and covered with silvery ribbed sheaths. The young pseudo-bulbs are green, and bear at the summit from four to six broadly-lanceolate deep green leaves twelve to sixteen inches long, which are traversed lengthwise by three conspicuous ribs or veins, and are more or less plaited. The stout glaucous-green, arching scape springs from the base of the young pseudo-bulb and reaches a length of two feet or more, the upper half being furnished with as many as thirty flowers, each of which is about two and a half or three inches across, if fully extended. The sepals and petals are broadly lanceolate-acute, deep green, and thickly covered with blackish purple spots, which are much more numerous on the sepals than on the petals. The thick, fleshy lip is ovate-acute when spread out, sharply recurved at the apex, and having a deep cavity at the base, the sides of which are colored green, with blackish purple spots, while the anterior portion becomes pale creamy yellow. The margin is furnished with a jagged, bristle-like fringe, which is longer and stiffer at the base. The column is green, speckled on each side at the base with purple-brown, and having two pale horns or antennæ passing from the sides in front into the cup of the lip.

C. atratum is apparently an easy species to grow, requiring the same treatment as others of the genus. Pots or baskets, with a compost of rough peat and sphagnum, placed over clean crocks, are equally suitable receptacles for it. When the new growth makes its appearance then watering must be regularly attended to, and the frequency of the supplies should be increased according to the rapidity of growth. A tolerably warm and moist house, which can be well ventilated without causing draughts, is well adapted for growing purposes, and although direct sunlight on the plants cannot be recommended with safety for more than a short time in the morning, nevertheless as lightsome a position as possible will be found best for ripening the growths, thus enabling them to store up abundant material for the resting period during the winter months.

London.

John Weathers.

Odontoglossum Schliperianum.—This is one of the most useful and at the same time prettiest of this large genus now in flower, and it deserves special mention, as the present is a very dull time of year for *Odontoglossums*, and, in fact, for any Orchids. *O. Schliperianum* belongs to the section containing *O. grande* and *O. Insleyi*, and it is difficult to distinguish one from the other when not in flower. *O. Schliperianum* produces its flowers on stout spikes from fifteen to thirty inches in length, and bears from five to fifteen or sometimes more flowers, which are about three inches in diameter. The sepals and petals are bright golden yellow, barred on the basal half with bright chestnut-brown; the lip is lighter in color and barred with lighter bands; the apical half of the sepals and petals are clear yellow, making a flower very much admired.

If flowering with *O. grande* this species might easily be taken for a smaller form of the latter, so much alike are they.

O. Schliperianum should be grown on the side-benches of the Cattleya-house, where it will be close to the glass and receive a good amount of sun and air. In watering, care must be taken not to wet the foliage, as this causes the objectionable black spots so often seen on the three species named above. Water given about once a week will amply suffice while the plants are growing, and it should be withheld almost entirely after growth is completed, in which respect they differ from most of the other cool *Odontoglossums*.

Easton, Pa.

Henry Clinkaberry.

Rose Gloire de Dijon.—With this I send you a few sprays of the old *Gloire de Dijon* Rose to show what fine buds one can have from this favorite plant all the season. The first flush of bloom in June is so abundant that unless the plants are well cared for and in very good soil many buds fail to develop fully.

But after the first bloom the plants rapidly make new growth, and one can usually find a few good buds at any time during the summer. October frosts only put a stop to their flowering. I have four plants with a southern exposure, which have been established some three or four years, and though somewhat neglected, they prove perfectly satisfactory low climbers. In winter a Russia mat is tacked over each plant, and so far they have proved as hardy as the ordinary Hybrid Perpetuals.

Elizabeth, N. J.

G.

[The buds are of good size and substance, and from their position at the extremity of the strong shoots they can be cut with long stems, which are furnished with the best of foliage.—Ed.]

The Forest.

Notes on the Ligneous Vegetation of the Sierra Madre de Nuevo Leon.—II.

AS I begin now to give an account of the forests of the Sierra Madre south of Monterey and of the trees which compose them, I am embarrassed by the conviction that the months spent in exploring that region were quite inadequate to the acquiring of all the facts concerning the species growing on the almost inaccessible steeps of those fearful mountains, or locked up in their interior fastnesses. I can do no more than to communicate what I learned there.

The usually abundant precipitation of rain upon the eastern slopes of this mountain chain ensures their being covered with a forest-growth whose size and density are in direct ratio to the amount of soil covering them. True, the depth of soil is slight, when compared with that covering our northern mountains, where glaciers have wrought in the ice age, and where frost still works to the same end; yet here, somehow, there is maintained a constant verdure, the sight of which is refreshing to eyes which have long rested on the eternal grays and browns of the bare mountains of the northern table-land.

On these fresh slopes and on the broader of the mountain tops *Pinus Montezumæ* finds its northern limit of distribution. It is a valuable tree, eighteen to twenty-four inches in diameter and forty to fifty feet high, and fills in this region the place held by *Pinus ponderosa* in the forests of New Mexico and Arizona. Its cones were seen to be extremely variable, the smaller being ovoid in shape and barely two and a half inches long, the larger oblong and fully six inches.

Beginning at a somewhat lower elevation, about 2,500 feet, but mingling with this species in about equal proportion and of no less size, was found another Pine ("Pl. Mex.," No. 1964), which has not yet been referred to any known species. These two Pines were seen to form some really fine belts of timber.

Of especial interest were belts of *Carya myristicæformis*, covering, largely to the exclusion of other species, certain rocky slopes. In the scantier soil this species makes but a scrubby growth, often no more than a shrub; but in moist and rich cañons it becomes a good-sized tree twelve to eighteen inches in diameter.

Carya olivæformis seemed to be restricted to wet cañons and springy places, and to attain to larger dimensions than the preceding.

The lower slopes of these mountains abound in wet cañons, and these are occupied by a dense growth of the following species: *Juglans rupestris* (doubtless this species, though the green nuts were three inches in diameter); *Quercus polymorpha*, attaining a size of two feet by sixty; *Quercus virens*, its maximum diameter three to five feet; *Platanus Mexicana*, a large tree and widely branching; *Fraxinus viridis*, var. *Berlandieri*, perhaps the largest of American Ashes; *Morus urticæfolia*, a small tree; *Tilia Mexicana*, eighteen to twenty-four inches in diameter and forty or fifty feet in height; *Chilopsis saligna*, amid tall trees itself tall but slender; *Ulmus crassifolia*, not large, as on river bottoms; *Planera aquatica*; *Bumelia lanuginosa*, var. *rigida*, six

to eight inches by fifteen to twenty feet; a variety of *Prunus Americana*, *Prunus Capuli*, the largest specimen seen being eighteen inches in diameter and forty to fifty feet high; *Cercis reniformis*, sometimes attaining to a diameter of one foot and a height of forty; *Leucæna pulverulenta*, *Cornus florida*, one foot by twenty-five, and *Staphylea Mexicana*, n. sp., six or eight inches by fifteen or twenty feet.

Several of the above list are found scattered in specimens of inferior size outside of the cañons. There they mingle with *Quercus Grahami*, a small tree most abundant from the lower to the higher slopes, whose bark supplies the tanneries of the region; *Q. oblongifolia*, not common here, and another species of *Quercus* as yet undetermined, and *Arbutus Texana*, from six to twelve inches in diameter, usually with low heads, with grotesque trunk and branches covered with smooth, white bark.

On the precipitous ledges of lime rock—even arising from the fissures of the great cañon walls or waving their leaves from the sharp mountain crests—are seen numerous specimens of the upland Palmetto, *Brahea dulcis*. In so dry and poor situations the plant seldom exceeds a height of twenty feet; but far to the south in low valleys of the south-eastern part of the state of San Luis Potosí, I have seen it rising to forty or fifty feet and forming close forests.

About the base of the mountains, especially on limestone ledges, associated with *Fraxinus Greggii* and *Heliella parvifolia*, which sometimes acquire the size and habit of small trees, and *Diospyros Texana*, here rather shrubby, we find *Amyris Madrensis*, n. sp., the largest specimens of which met with were seven inches by twenty-five feet, and *Sargentia Greggii*, n. gen., one foot by twenty-five. The foliage of these two is evergreen; and *Sargentia*, with its large, shining leaves, and yellow, oval fruits an inch long, is an interesting plant. Except in the richer gulches it usually appears here near its northern limit of distribution as a large shrub; but as far south as the state of Vera Cruz and at but slight elevation above the sea I have seen it common in tropical forests as a tall, slender-stemmed tree.

Common in rich valleys among the foot-hills we find *Acacia Farnesiana* and *Acacia flexicaulis*, the former one foot in diameter and the latter one and a half to three feet, both low-branching, round-headed trees. *Ehretia elliptica*, more erect in habit and one to three feet through; *Condalia cuneata*, tree-like in habit, but a very small tree; *Pithecolobium brevifolium*, and occasional specimens of *Sapindus acuminatus*.

The principal shrubs or woody vines noticed in the Sierra Madre are: *Cocculus diversifolius*; *Berberis gracilis*, in broad clumps ten feet high; *Berberis trifoliolata*, a smaller plant; *Fouquieria splendens*, not abundant here in its eastern limit; *Decalopis Coulteri*, five to fifteen feet high, slender, and with but few branches, very abundant on limestone ledges and seen in similar situations in south-eastern San Luis Potosí, but appearing less common; *Karwinskia Humboldtiana*, here two or three feet high and spreading by its roots in wide clumps, but found in Jalisco twenty feet high and with single stems; *Hiræa macroptera*, extensively trailing over walls, shrubs, etc., and bright during many weeks of summer with profuse yellow flowers; *Hiræa lilacina*, rather rare; *Xanthoxylum Fagara*, fifteen or twenty feet high, often forming thickets, not noticed here, with single stems; *Rhamnus*, sp., seen here as a tall shrub, but in Chihuahua as a small tree; *Coludina Greggii*, reaching twenty feet in height; *Ceanothus azureus*, slender, ten feet; *Ampelopsis quinquefolia*, common and higher on the mountains, its variety *pubescens* of Gray (*A. pubescens*); *Ungradiad speciosa*; *Dodonea viscosa*; *Rhus virens*, a large stout shrub, sometimes almost a tree, a handsome evergreen with panicles of pink flowers or scarlet fruits; *Rhus Toxicodendron*; *Rhus Mexicana* (*Pistacia Mexicana*), observed six or eight inches in diameter and twenty or more feet high, but always with the habit of a shrub, branching at the ground and spreading; *Eysenhardtia amorphioides*, five to fifteen feet high; *Dalea frutescens*, var., a slender

shrub, six to ten feet high; *Dalea Domingensis*, two or three feet high; *Sophora secundiflora*, about fifteen feet; *Bauhinia lunarioides*, fifteen or twenty feet high; *Mimosa malacophylla*, a horribly hook-spined vine, widely climbing over shrubs; *Rubus trivialis*; *Cotoneaster denticulata*, eight to twelve feet high, with somewhat virgate stems; *Rosa Mexicana*, low and slender, on cool grassy slopes, under Oaks and Pines; *Philadelphus Coulteri*, on cliffs and ledges; *Nesaea salicifolia*, common along streams; *Garrya ovata*, var., *Abelia coriacea*, on summit ledges; *Randia Xalapinsis*, an erect shrub, ten to twenty feet high; *Chiococca phenostemon*, with wide, shining evergreen leaves, and panicles of white flowers or white fruits, very ornamental, so large and stout a shrub that I expect yet to find it as a tree; *Wyethia Mexicana*, n. sp., a composite shrub three to six feet high; *Forestiera racemosa*, n. sp., stems two to six inches thick, and ten to twenty feet high in clumps; *Buddleia Humboldtiana*, extremely variable in size and character; *Brachistus Pringlii*, n. sp., here about three feet high, further south ten; *Lantana Camara*; *Lippia lycioides*; *Lippia macrostachya*, six to ten feet; *Berendtia spinulosa*, n. sp., rooting from fissures of the driest limestone cliffs and spreading over their faces; *Croton fruticulosus*, here a fall shrub; *Bernardia myricæfolia*; and *Stillingia sanguinolenta*, some six feet high, in large clumps by streams.

Charlotte, Vt.

C. G. Pringle.

Periodical Literature.

The Blue Grass region of Kentucky is charmingly described by John Burroughs in the *Century Magazine* for July, under the title, "A Taste of Kentucky Blue Grass." It is in truth a taste he gives us—more than a mere glimpse; the soul of the landscape as well as its body has appealed to him, and he transports us for a moment into its generous open spaces and gives us the flavor of its cool winds and luscious vegetation. As he says, the man of the woods and the man of the fields both reside within him, it was, of course, to the latter that this region spoke so attractively. Charming indeed is an opening passage: "A perfect issue of Grass or Grain is a satisfaction to look upon, because it is a success. These things have the beauty of an end exactly fulfilled, the beauty of perfect fitness and proportion. The barren in nature is ugly and repels us, unless it be on such a scale and convey such a suggestion of power as to awaken the emotion of the sublime. What can be less inviting than a neglected and exhausted Virginia farm, the thin red soil showing here and there through the ragged and scanty turf? and what, on the other hand, can please the eye of a countryman more than the unbroken verdancy and fertility of a Kentucky Blue Grass farm? . . . One likes to see the earth's surface lifted up and undulating a little, as if it heaved and swelled with emotion; it suggests more life, and at the same time that the sense of repose is greater. There is no repose in a prairie; it is stagnation, it is a dead level. Those immense stretches of flat land pain the eye, as if all life and expression had gone from the face of the earth. There is just unevenness enough in the Blue Grass region to give mobility and variety to the landscape. From almost any given point one commands broad and extensive views—immense fields of Wheat or Barley, or Corn or Hemp, or Grass or Clover, or of woodland pastures. . . . The Blue Grass region is as large as the state of Massachusetts, and is, on the whole, the finest bit of the earth's surface, with the exception of parts of England, I have yet seen. In one way it is more pleasing than anything one sees in England, on account of the greater sense of freedom and roominess which it gives one. Everything is on a large, generous scale. The fields are not so cut up, nor the roadways so narrow, nor the fences so prohibitory. Indeed, the distinguishing feature of this country is its breadth: one sees fields of Corn or Wheat or Clover of from fifty to one hundred acres each. But the feature of this part of Kentucky which struck me the most forcibly, and which is perhaps the most unique, are the immense sylvan or woodland pastures. The forests are simply vast grassy orchards of Maple and Oak, or other trees, where the herds graze and repose. They everywhere give a look to the land as of royal parks and commons. They are as clean as a meadow and as inviting as long, grassy vistas and circles of cool shade can make them. All the saplings and bushy undergrowths common to forests have been removed, leaving only the large trees scattered here and there, which seem to protect rather than

occupy the ground. Such a look of leisure, of freedom, of amplitude, as these forest-groves give to the landscape!

"What vistas, what aisles, what retreats, what depths of sunshine and shadow! The grass is as uniform as a carpet and grows quite up to the boles of the trees. One peculiarity of the Blue Grass is that it takes complete possession of the soil; it suffers no rival; it is as uniform as a fall of snow. . . . Sometimes the more open of these forest lands are tilled; I saw fine crops of hemp growing on them, and in one or two cases corn. But where the land has never been under cultivation it is remarkably smooth—one can drive with a buggy with perfect ease and freedom anywhere through these woods. The ground is as smooth as if it had been rolled."

The fertility of this region may well seem marvelous to the dwellers on New England farms—a fertility, as Mr. Burroughs explains, which is due to the old limestone rock "laid down in the ancient Silurian seas. The earth's surface seems once to have bulged up here like a great bubble, and then to have been planed or ground off by the elements. This wearing away process removed all the more recent formations, the coal beds and the conglomerate or other rocks beneath them, and left this ancient limestone exposed. Its continued decay keeps up the fertility of the soil. Wheat and Corn and Clover are rotated for fifty years upon the same fields without manure, and without any falling off in their productiveness. Where the soil is removed the rock presents that rough, honeycombed appearance which surfaces do that have been worm-eaten instead of worn. The tooth which has gnawed, and is still gnawing it, is the carbonic acid carried into the earth by rain-water. Hence, unlike the prairies of the west, the fertility of this soil perpetually renews itself. The Blue Grass seems native to this region; any field left to itself will presently be covered with Blue Grass. It is not cut for hay, but is for grazing alone. Fields which have been protected during the fall yield good pasturage even in winter. And a Kentucky winter is no light affair, the mercury often falling fifteen or twenty degrees below zero."

Correspondence.

A Troublesome Grass.

To the Editor of GARDEN AND FOREST:

Sir.—I enclose a sample of coarse Grass which is infesting my lawn. Will you kindly tell me what it is, and how I shall proceed to get rid of it? It has been making a vigorous growth all through June, and although the Blue Grass on the lawn is cut closely every week, this jointed intruder snakes along under it and throws out shoots a yard in length which root at every joint. It seems indestructible, unharmed by the sun of July or the frosts of winter. Is there any hope for my lawn?

Frankfort, Ky.

Mrs. W. T. S.

[This letter gives a forcible description of some of the bad qualities of the Bermuda Grass (*Cynodon Dactylon*) and the accompanying specimens prove that this is the pest.

Bermuda Grass, sometimes called Wire or Scutch Grass, is a strange combination of the good and bad. In the northern states it is a dwarfed, late-starting grass of no value for forage, and may become one of the worst of weeds, requiring the utmost vigilance to subdue it. In the south it is highly prized for pasturage, as it thrives upon sandy soil under a tropical sun, forming a stiff turf that binds securely the loose earth upon which it grows. Professor Beal, in his work on "Grasses of North America," quotes from Professor Phares, an expert student of southern grasses, as follows: "As a permanent pasture grass I know no other that I consider so valuable as this." Howard says that it is doubtful whether any crop is more valuable in the south than the Bermuda Grass when grown at its best. When we leave the south and reach as far north as Kansas, for example, it has been determined by careful experimentation that this grass is worthless for either pasture or meadow—it is only a weed of the most pernicious sort. When looked at from the weed-standpoint, as it must be in the belt of states between the north and south, it is encouraging to know that it rarely seeds in the United States; but like some other species of plants that rarely mature fruit, the Bermuda Grass has a remarkable way of spreading by its root-stocks, in which tendency it resembles our own Quack Grass. To eradicate the pest from a

Blue Grass lawn there seems to be no other way but to clean the land by digging out and destroying every root and root-stock so far as possible, and then to watch carefully for its second coming and attack it again at its earliest appearance.—Ed.]

Notes.

It is believed that the Hollyhock was brought to Europe from China as early as the year 1573.

About 1,400 species of Orchids, 1,100 of Ferns and 500 of Palms and Cycads are grown in the Botanic Gardens at Kew.

An edition of Mr. George H. Ellwanger's "The Garden's Story" has been published in England with a pleasant preface by C. Wooley Dod.

According to a letter recently published in the *Popular Science Monthly* the finest hand-spun Belgian flax, such as is used in making costly lace, is worth from \$900 to \$1,000 a ton.

Mr. James H. Laing, of the Messrs. John Laing & Sons, the well known nurserymen, florists and specialists in Begonias, of Forest Hill, London, has sailed for New York on a tour through the United States.

A writer in *The Argosy*, Demerara, says that the blue spikes of the pretty pond-weed, *Eichornia tricolor*, from Brazil, are excellent for cutting. The little flowers fade at evening, but a new crop opens next morning, so that a spike will continue to bloom for more than a week until all its buds are exhausted.

Writing in *Zoe*, Mr. F. H. Vaslit notes the following plants as having escaped from cultivation and become naturalized in the Coast Range Mountains: Garden Chrysanthemums, which seem to be becoming true "weeds," that is, are already "rather troublesome to get rid of"; Fuller's Teazle (*Dipsacus Fullonum*); Mourning Bride (*Scabiosa atropurpurea*); and the larger Periwinkle (*Vinca major*).

The English horticultural journals continue to lament the prevalence of the Lily disease among the Ascension Lilies. In some places not a single flower bloomed this year from a hundred bulbs. This disease has been very deadly in this country and is so still in many places, but near New York this year it seems to have abated and the Lilies in many gardens have proved unusually strong and beautiful.

It is said that since the opening of navigation on the Caspian Sea this spring more cotton has been brought from central Asia to Moscow than during the whole of the year 1889. Experiments are now being made with the Cotton-plant in the Crimean peninsula and in other places along the coast of the Black Sea with seed brought partly from more eastern regions and partly from America.

It is only in very recent years that the name Gardenia has been commonly applied in this country to the handsome flowers for which it is the correct botanical name as well as the one almost invariably used in England. Here they have been most generally called Cape Jessamines, although they come from China and are not botanically Jasminums. Yet the genus was named for Dr. Alexander Garden, of Charleston, South Carolina, who was a valued correspondent of Linnæus.

Limnanthemum Indicum, just now blooming, lifts its white, star-shaped flowers, which are about as large as a five-cent piece, only an inch or two above the water. The inside of the petals—that is, their upper side when opened—is covered with fine filaments which stand as thickly as those on the Mrs. Hardy Chrysanthemum, and these give the flower such a light and feathery look that the name "Water Snowflake" would suit it well. It has floating foliage like that of a miniature *Nymphæa*.

Mr. William W. Lunt, of Hingham, Massachusetts, has sent to this office for inspection a sketch in colors of a remarkably fine variety of *Cypripedium* (*Selenipedium*) *caudatum giganteum* which differs from the type in that the prevailing color is a reddish or bronze-like brown and yellow, instead of dark brown and greenish. The pouch is also more nearly globular, but the striking feature of the plant is its high-colored staminate and the great size of the lower sepal. The entire flower is large. The plant is in a four-inch pot, and has three old growths and three breaks.

The yellow Water Lily which originated with Monsieur Marliac in France and which was named by him *Nymphæa Marliacea chromatella* has proved quite hardy in Bordentown, New Jersey, where it remained all winter in a basin eighteen

inches deep on the grounds of Mr. Sturtevant. It is now blooming in several places near this city and it is one of the handsomest of aquatic plants. It is a trifle larger than *Nymphæa odorata*, fragrant, with lemon-yellow petals and orange stamens which intensify the apparent richness of its color. Its foliage resembles that of *N. candidissima* and it flowers continuously from early summer until frost.

A correspondent of the *Gardeners' Chronicle* gives the following as a select list of the finest varieties of Laced Pinks: they are Beauty, a small flower, but very free to cut from; Bayard, a large and full flower, beautifully laced with bright red, a grand variety that laces well, and probably the best Pink in cultivation; Clara, smooth, fine, a beautiful petal, regularly laced with reddish purple; Empress of India, a very distinct variety with rich deep lacing, extra fine; Eurydice and Excelsior, very good; Device, George White, Harry Hooper, rich dark lacing; Jessica, Minerva, and Modesty, a very early variety, with bright rosy purple lacing; Mrs. Waite, small, but very pretty and free, and a charming border variety; and Rosy Morn, a very handsome Pink, with broad lacing.

A correspondent inquires how Professor Smith uses an umbrella with a sack attachment to gather in Rose-chafers. The collecting umbrella had better be specially made. Over an old frame stretch a cover of oiled-silk or linen, and cut out the crown, so that when the umbrella is open there will be a round hole, about six inches in diameter, in the centre. To this opening is sewed a bag about eighteen inches in length, open both ends, but so arranged that the bottom can be drawn together by a string. This bag, which will hang from the bottom of the umbrella when inverted, should also be of oiled-silk or linen, so as not to give the beetles a foothold. To any rough material the insects will cling so closely that they must be picked off to be dislodged, and from a cheese-cloth bag, such as Professor Smith first tried, the beetles crawled for hours afterward. To a smooth surface they cannot cling, and by loosening the string at the bottom of the bag the whole contents can be readily dumped.

In one of his pleasant articles in *The Garden*, a "Gloucestershire Parson" writes with feeling of the ravages among rare plants by collectors: "It is sad to see the depredations which are made upon some of our rarer seaside plants. I have seen ladies—'towrists,' as the villagers generally call them—go down with baskets, trowels and small steps into the beautiful sea caves to carry off from thence huge specimens of *Asplenium marinum*. Now nothing adapts itself so well to culture in a warm house as this *Asplenium*. It rapidly makes a lovely specimen with its dark green, glossy fronds. But to rob the dripping caves of all their beauty in such a way is really too selfish. Moreover, small specimens always grow better than large ones, so that it is a mistake for the depredators to trouble and burden themselves with baskets and implements and large plants. I believe I still know of caves, as yet untouched by the tourist depredator, where this Fern luxuriates, and spreads its dark green leaves in the shadow of the rock to the soft sea breeze. But ere long every place will be found out."

Dr. Harris, in a paper read before the Pennsylvania Horticultural Society recently, called attention to the fact that some of the most valuable vegetable productions, like the White Potato, the Tomato and the Egg-plant, are the results of development in a family which produces the Tobacco, the Jamestown Weed and the deadly Nightshade; and still more singular is it that edible innocence in a product may be intimately associated with a poisonous element in the plant. Starch-yielding tubers may even be in themselves an association of simplicity and venom, as we find in the Cassava, from which tapioca is obtained, the soluble elements of the tuber being poisonous, and the insoluble starch and pulp edible. In the White Potato we have a *Solanum* which has poisonous sprouts and fruit, with a valuable and innocent tuber or subterranean root-stock. The poison, solania, is found in the white sprouts of the tuber and in the green seed-ball or fruit, but not in the tuber as prepared for the table by boiling or roasting. Solania is not a powerful poison, and is one of very uncertain strength; still, death has been produced in childhood by eating the balls. Very young tubers and old sprouted ones are unwholesome food, for these contain a fraction of the poison. The Tomato plant contains solania, while the fruit, which has the same unpleasant odor, is free from it. Three deadly poisons, among the most potent of all active vegetable principles, are obtained from some of the *Solanaceæ*—namely, nicotia, from Tobacco; daturia, from Stramonium, and atropia, from Belladonna. One drop of pure nicotia will kill a large dog in a few minutes, and the other two are fatal in minute quantities.

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Protection for the Originators of New Plants.

HOW the originators or introducers of new varieties of plants can be protected in what seems to be clearly their right to some special proprietorship of their productions is a subject that has often been discussed. At the late Convention of Nurserymen in this city the fact was emphasized that very few persons in this country who had originated valuable varieties of fruit had received any direct benefit from it. As an illustration it was stated that Mr. Worden, who brought out the Grape named after him, and which many people esteem, all things considered, as the best black Grape grown, is now a poor man, and never made \$500 from this valuable introduction. If inventors are protected by law against the piracy of ideas which have cost them labor and study, it would seem just that a man should be able to reap some reward for having brought out after much thought and experiment a new fruit which may add to the wealth and comfort of millions.

Different plans for patenting plants have been often advocated, but the essential objection to them all was well stated by Professor Bailey more than a year ago in this journal (ii., 1888), as follows: "It is exceedingly doubtful if a patent could be secured for varieties which spring up from a chance seedling, and most of our varieties come in this way. But if the patent were granted there are innumerable cases in which no jury of experts could agree concerning the distinctness of varieties." Few cautious persons would be willing to swear to the identity of a given Strawberry or Rose, and it would be difficult to prove in any given instance that the flower or fruit in question was not a new one closely resembling an older variety.

In an earlier number, vol. ii., p. 46, Mr. A. L. Bancroft, of California, suggested a horticultural register wherein separate plants like Roses, Chrysanthemums, Ferns, Apples, Grapes, could be kept and numbered, on a system similar to that adopted in the various herd-books where choice live stock is registered, but we then pointed out that a herd-book was devised for a purpose quite distinct from those which it is proposed to secure by a system of plant registration. Individual animals are registered so that they may be identified, that their pedigree may be estab-

lished and that purity of blood may be maintained in a given breed or strain of live stock. In the case of plants, where the registration of one individual must stand for an entire class and where the parentage is often unknown and always of secondary importance, it is difficult to see how such a list would prevent a duplication of names for the same plant or the selling of different plants under the same name. Mr. Bancroft's scheme has been carefully elaborated since then, and a plan of registration has been adopted by the California State Horticultural Society. We have no space here to go into the details of the plan, which have been very carefully elaborated, but as it was discussed it seemed to the nurserymen in their convention that it was quite too cumbersome to be practical and effective.

There is, however, considerable protection already given to the originator of a new fruit in the copyright law. Mr. Hoyt, of New Canaan, Connecticut, stated that he had taken out such a right on his label of the Green Mountain Grape and had been instructed by eminent legal authority that no man could use this title on a label to a Grape vine and sell it without his consent. It is true that if any one should buy a plant of Mr. Hoyt he could propagate it as largely as he chose for his own use, or could sell the vines under another name, but there would be little temptation to a grower to sell a really valuable variety under a name which would conceal its identity. The name is the very thing the plant-pirate most wants, and he very often sells nothing else but the name of a good variety, attaching it to an entirely different plant from the one it really belongs to. This registered trade-mark has proved of value too in preventing the sale of spurious plants under the label so registered, so that copyrighting assists in preventing the sale by unauthorized persons both of genuine plants and their counterfeits.

It is hard to see how much greater protection than this can be secured by a horticultural register. The plan of registering new plants has, however, many merits in other directions. It would be of interest to have an accurate description of any new plant filed in some public office, with its portrait and parentage so far as known. We should like to compare a plant and berry of Hovey's Seedling Strawberry as grown to-day with a preserved specimen of the original plant and its berry, or accurate portraits and descriptions of them, to see if any variation from the type had taken place. In questions of identity the register might give some assistance, but the inherent difficulties of accurate varietal description would remain. An organized effort to secure registration would be of value, too, in enlisting the co-operation of all horticulturists to secure to originators their rights, for, although no system yet devised can add much to the protection now given by the trade-mark laws, this protection would be much more effective if it had an active and united public sentiment behind it.

Of course this protection to the introducers of new plants would make such plants more expensive for a time, just as patented machinery and copyrighted literature is more expensive. But although this increased price might be considered a burden upon horticulture the advantages gained would be positive and important. Chief among these would be the encouragement offered to careful experiments in hybridizing. When growers can feel sure that they will reap some reward from discoveries in this field, we may entertain a reasonable hope that the breeding of plants may be reduced to something like a system or a science.

It is well known that several of the groves of the Giant Sequoia in the California Mountains have been invaded by the axe and that lumber from many of the Big Trees has gone into the market as Redwood. Most of the timberlands in which the Sequoia occurs have passed into the hands of lumbermen and speculators; but according to the *Visalia Delta*, one grove of these grand trees still remains in Tulare County in the hands of the Government. An enthusiastic description of the tract is given, but this was brought out by the fact that surveyors and locators are

now exploring the land and preparing to pounce upon it in the expectation that it is about to be opened for entry.

It seems that five years ago several townships in this county were withdrawn from entry, on account of alleged fraudulent practices, and it has been understood that they would not be restored until after official examination into the character of the surveys. It was believed, therefore, that if the Department changed its decision ample public notice would be given. It has turned out, however, that some of the Sequoia lands have been suddenly restored, and were at once secured by speculators and lumbermen, who seemed to have been prepared for the occasion by some private notification. The presence of locators in the tract mentioned naturally arouses the suspicion that the last remaining grove is doomed to the fate of all the others.

May we not hope that Secretary Noble will interpose to prevent such a disaster? Surely the Government should hesitate before surrendering to destruction this last cluster of these world-famous trees. If it ever is a duty of civilized society to preserve for posterity objects of natural beauty or grandeur, nothing more worthy of such protection than these giant trees can be named. They ought to remain the property of the nation forever.

The Gardens of the Fountain at Nîmes.*

FEW gardens in Europe equal in beauty those at Nîmes, which the people call simply *La Fontaine*, considering, it seems, the rest of the enclosure a mere appanage of the fountain itself. Few gardens, even in Italy, have greater historic interest, and none in any land surpass them in individuality or in the happy combination of formal and natural elements. Their earliest features date from before the time of Christ; their latest were created in our own century. Yet all now blend in an enchanting harmony of happily managed contrasts.

The so-called fountain is really a great spring filling a basin seventy-five feet in diameter and twenty-five feet in depth, in the natural rock on a steep hill-side, and fed from natural underground reservoirs, some of which are so distant that the waters will suddenly surge up in it at times when no rain has fallen at Nîmes. To its existence was due the existence of the city. Around it in Celtic times grew up a small town called Nemoz, whose inhabitants naturally held its plenteous waters sacred. Under Roman rule and the Latinized name of Nemausus this grew to a place of first importance. The fountain was nearer the centre of the Roman than of the modern city, and was utilized in baths which necessitated a group of beautiful buildings, some relics of which still survive.

The baths proper and most of the accessory structures were probably destroyed in the invasion of the Visigoths in the fifth century; and they or the quick-succeeding Franks broke the dikes which had regulated the flow of the waters and caused them to seek a new channel down the hill-side. But the sacred edifice (its ruins are now popularly called the Temple of Diana), which stood against the hill-side, not far from the spring, was saved and became the church of a house of nuns upon which, in 991, the fountain and the adjacent lands had been bestowed. It was called the *Abbaye de St.-Sauveur-de-la-Font*, and many were the disputes between its inmates and the townsfolk, as the centuries rolled by, over the possession of the spring and of the mills turned by its escaping waters, as well as over the right to use certain meadows adjoining the canal as a place of public promenade.

A settlement was made in favor of the town in 1352, but disputes still went on with regard to the rights of the nuns over the fountain itself and the canal, until the monastery was razed, in 1563, the nuns were dispersed, and, in the religious conflicts of the following year, it was reduced to the ruinous, but picturesque, state in which we now see it.

For generations after, the spring was constantly discussed, with a view to increasing and regulating its flow, and thus preventing that almost total drying up which, in late summer, brought the local industries to a stand-still. Trees were planted, and there was much digging among the old baths, but little was accomplished until 1744, when Jacques Philippe Maréchal, Director of Fortifications for the Province of Lan-

guedoc, presented a plan which was accepted, and associated with himself in its execution an architect of Nîmes named Dardailhon, whose scheme had seemed to him the best of the preceding ones. The work was at once begun, and was finished in nine years at a cost of about 1,000,000 francs.

Let us see now how the gardens look to-day. The main approach is through a wide boulevard, planted with double rows of trees on either side, which brings us to the great iron gates seen in the distance in our picture (see page 371). Hence to right and left the eye follows broad tree-bordered canals, widening into many-angled basins at the two corners of the garden, and thence to the right, leading the waters of the distant spring down a wide shady street, which really deserves the name of *Quai de la Fontaine*. Entering the gates we are in a large rectangular space, through which run quadruple lines of ancient trees, leading the eye to the bath as the central feature of the garden. Other avenues surround the space; beyond them runs the canal and still more avenues. The canal is broken in its circuit of this space only by the entrance path at the gateway, and opposite by two bridge-like paths between which it is continued as a square basin. The avenue-trees are chiefly Lindens and Horse-chestnuts. As we follow the bridge-like paths, we see in front of us—in the centre of a wide expanse of gravel still planted with shady avenues—the modernized remains of the baths, which our illustration shows from the opposite point of view. They consist simply of a great square, sunken and flooded basin, surrounded by a colonnade, behind which lie small rooms or cells, and in the centre of which rises an island, where many changes were made, notably those in the centre of the picture, where the angle vases and centre group take the place of interesting Roman relics. Of course, all the balustrades and other vases, which add so much to the beauty of the arrangement, are works of Maréchal's time. Indeed, the whole thing is so distinctly Rococo in its general effect and in almost all its details that it is hard to believe any part of it antedates the age of Louis Quinze. The island is a mass of blossoming shrubs, largely broad-leaved evergreens, amid which, in late July, great sprays of Pink Oleander were blazing—all forming the most effective of backgrounds for the graceful, if somewhat affected, work of the Rococo sculptor.

The art with which the vicinity of the basin is treated will be clearly appreciated from the picture and the fine contrasts of the snowy balustrades with the thick masses of foliage. The canal in the foreground leads diagonally for a short distance to the spring, whose great basin is bordered in a similar way so that its natural character is scarcely apparent. But all this is only a small part of the garden. To the left, if we stand as in the picture, behind the trees in the middle distance, is a broad triangular graveled space, thickly shaded by rows of Lindens, Horse-chestnuts and Planes, with Orange-trees between them in boxes gayly striped with yellow and green. Closer at hand the hill-sides rise all around us; they are low on our right, sheltering the Temple of Diana near the spring; on our left, beyond a broad open space and a strip of lawn, they rise almost perpendicularly as a wall of rock about fifty feet in height; and behind us they are again as high, and are backed in their turn by the steep and lofty hill called Mont Cavalier, on whose summit stands the ancient Tour Magne.

Here we begin to see how nature has been blended with art in this garden. The hill near the temple is covered with a seemingly natural growth of trees, chiefly Pines. Opposite, the perpendicular rock is clothed with the richest masses of free-growing vines and creepers. Great spiky Agaves and stiff Palms grow from the crevices and ledges through the mats of swaying foliage, making a delightful picture. Nothing could be finer than this cliff as a back for the diagonal perspective of avenues and balustrades, if the little lawn at its foot were not disfigured by an ugly statue of a local poet and by formal flower-beds of garish hue, perhaps the only note of bad taste to be found in the whole garden.

It would not have been well, however, to continue the naturalistic treatment adopted for the sides of this little amphitheatre across its back. Here something architectural was needed to carry on the scheme adopted in the centre, and, moreover, some dignified approach to the Mont Cavalier; so here we have a stately terraced stairway of marble rising to a broad balustraded upper terrace, from which we look over the whole lower garden, and again admire the vine-wreathed cliff, and see that its top (with which we are now on a level) is planted with forest-trees and laid out with winding walks.

So, too, is the whole steep, lofty side of the Mont Cavalier behind us. At the beginning of our century it was a burnt bare cone, its poor soil bearing only scattered tufts of grass and stunted shrubs. About 1820, thanks to the energy of the

*The historical facts in this sketch have been gathered from Monsieur L. Boucoiran's *Monographie de la Fontaine de Nîmes*, published in 1859. As the motto of his little book he quotes these lines from Ausonius:

Divona Celtarum lingua fons addite divis
Non Aponus potu, vitrea non luce Nemausus
Purior.

mayor whose name the hill now bears, it was planted to the top, chiefly with Aleppo Pines, which are mingled with Cypress and other trees, and near the paths a thick growth of shrubs. The walks are as thickly shaded as in a natural forest, and every now and then give us an enchanting glimpse of the lower gardens. About half way up they widen into a broad terrace-like path, running straight across the hill, and extending beyond the slope we have ascended, above a more precipitous slope, where a great retaining wall sustains it. Here one may pause to rest, to enjoy the beautiful prospect over the city.

Above this terrace the ascent is somewhat less steep and the paths straighter, and finally, when the relief has been well earned, we come out on a small, level, naked plateau, in the centre of which rises the famous Tour Magne.

This is a large and lofty ruined tower, evidently of Roman handiwork, which we can ascend for the sake of a magnificent panorama—Nîmes on one side, and a vast, green, broken, village-dotted plain elsewhere, encircled by distant hills, whose yellow bareness, contrasted with the green lowlands, gives us the full beauty of color that characterizes the *Midi* in midsummer. Surely nowhere else does so impressive a monument, looking on so magnificent a scene, give the finishing charm—literally the crowning charm—to gardens so lovely and so varied. Hardly in its perfect estate could the tower have been more impressive than now, an almost shapeless yet splendid giant, golden yellow and gray in color, and fringed all over with little flowering plants, among which here and there a young wild Fig-tree has taken vigorous root in some larger crevice. The hill-top around it is bare and encircled with a wall over which one gets views almost as fine as from the top of the tower itself.

Turning away at last, descending the forest-clad slopes in the brilliant sunset light and coming to terrace after terrace, we pause again on the lowest to note once more the effect of Maréchal's Rococo garden. We may abuse the Louis Quinze period as we will from the point of view of that "high art" which means serious intellectual work with brush and chisel. But it was a truly artistic period none the less—with clear ideals of its own and great skill in expressing them; a period which created works of genuine and individual beauty, though this beauty meant grace and charm rather than nobility and power. Above all, it was a period of decorative art, and nowhere did it find a better field than in gardening. The sins of those who made this garden and "improved" the Roman baths were great, according to the conscience of our archæological times. But they produced a wonderful new work of art, while, had we such relics of antiquity to deal with, we should only produce an out-door museum of relics.

A point to be noted, as in contrast to our northern ideas of garden-making, is that all this beauty exists with scarcely any use of grass. There are no lawns save the one bit which runs beneath the perpendicular cliff. Even flowers, against which the climate does not protest as it does against grass, play no important rôle, except in the shape of flowering shrubs. But for the intrusive beds already referred to, there are flowers only in a few places between the avenues, where little rectangular beds lie, surrounded with Box edgings. Gravel, marble, shrubs and trees—these are the elements with which the designer has worked. Yet the trees are so many and so fine that, while they do not interfere with the effect of the architectural features, they cover most of the garden with a cool green roof, and its general aspect, even in midsummer, is deliciously umbrageous and refreshing. When the trees are bare in the short midwinter of this region, the wisdom of planting so many broad-leaved evergreen shrubs must be manifest. But summer is the time to see the south of France. Then, and then only, it is truly the *Midi*; truly the enchanting half-way station between the real north and the real tropical south, combining the beauties of both, and vexing us neither by the cold rains and dull skies of the one nor by the unbearable heat of the other.

The Alleghanies of Virginia in June.

MOUNTAIN LAKE, the new name of the pretty little sheet of water which for nearly a century has been known by the herdsmen as Salt or Salting Pond, from the fact that they used to collect there to count and salt their cattle, is situated at the foot of Bald Knob, in Giles County, at an altitude of about 4,000 feet. The lake, as well as 100,000 acres of mountain and valley land around it, belongs to a gentleman in Washington, who also owns the comfortable hotel at its head. It is a mile long, closely surrounded by an almost impenetrable thicket of *Rhododendron maximum* and *Kalmia latifolia*,

and overshadowed by a few tall old Hemlocks and by high rocky ridges, which are covered by a young growth of White Oak and Black Birch.

The *Rhododendron* and *Kalmia* make such a display as they only make in the southern Alleghanies, many of them approaching twenty feet in height. The *Kalmia* was in bud and just beginning to bloom when we reached Salt Pond Mountain on the 30th of May. Great beds of *Viola blanda*, *V. primulaefolia*, and *V. cucullata*, with its variety, grow down to the water's edge on the sloping meadow in front of the hotel. It is the home of Violets. Two yellow ones, *V. pubescens* and *V. hastata*, are in bloom in the woods near by; *V. rotundifolia* and *V. sagittata* are ripening their seeds on the shady hill-side, and *V. Canadensis* has followed us up the mountain, where, in a swamp by the road, it is nearly a foot tall, the flowers large and showy, all the pretty white petals showing a delicate lilac beneath. *V. pedata* grows along the path to Bald Knob, and up there, on the exposed south side of the ridge among stunted patches of *Kalmia* and *Vaccinium*, is the prettiest of all, the light blue and velvety purple *V. pedata*, var. *bicolor*, as large and much more showy than the typical plant growing near it.

Bald Knob is about 4,500 feet in altitude, the highest of the Alleghanies of Virginia, it is claimed, and from the summit five states are said to be in sight. The view is very beautiful. The great ranges of mountains, stretching north into West Virginia and south into North Carolina, are all densely wooded as well as most of the valleys, though there are many small, poorly tilled farms scattered among the mountains. Bald Knob is at the end of a long rocky ridge, and is one vast flower-garden. The old gray rocks are covered with *Saxifraga leucanthemifolia* in full bloom, and deep down in a cool crevice the tiny *Asplenium montanum* has found a firm foothold in every crevice. *Heuchera villosa* is there also, and side by side grow *Ilex monticola* and *Ribes rotundifolia*. Further down on the slope another Gooseberry, *Ribes Cynosbati*, is ripening its curious prickly fruit.

On the ridge opposite, just above the lake, the flame-colored *Azalea* (*Rhododendron calendulaceum*) flaunts its gorgeous flowers. They are of every shade, from light lemon-yellow to the most brilliant fire-red, and make a great contrast to the pretty, delicate rose-pink flowers of *Rhododendron nudiflorum* which grows amongst it. Both *Azaleas* and the Mountain Laurel are abundant through the woods. The true Lily-of-the-Valley, *Convallaria majalis*, is everywhere under our feet; its white bells larger and most fragrant, its beautiful glossy leaves taller and wider than those of the cultivated plants at home. Its companion among the rocks is *Anemone trifolia*, a much larger and coarser plant than the delicate little Wind-flower (*A. Nemorosa*) that grows in low swampy ground near New York. Both *Clintonias* are here, *C. umbellata*, with its snowy umbels and broad shining leaves, and the less showy, but equally pretty, *C. borealis*, with its graceful clusters of light greenish bells, which later on will turn into conspicuous umbels of bright blue berries; and, abundant all through the woods, with their heads well up, in tall, stiff groups, are the curious fragrant flowers of the smaller yellow Lady's Slipper (*Cypripedium parviflorum*). The stemless Lady's Slipper (*C. acaule*) is as plentiful up on the mountain as it is in the sandy woods of Massachusetts and New Jersey. *Sedum ternatum* makes great mats on the rocks in the woods and is still in bloom, and near the top of the slope we come upon a great patch of the Painted Cup (*Castilleja coccinea*), its scarlet flowers making brilliant patches of color through the low growth of young Birches.

Trillium grandiflorum is the most common of the mountain flowers, and well deserves its specific name, though it varies so greatly in size and color that it seems hardly possible that the one name can fit all its forms. It is white, pink and a deep magenta, some of the great petals three inches long, others again not larger than those of the pretty, delicate little Painted Trillium (*T. erythrocarpum*) that grows with it. The Blazing Star (*Chamelirium luteum*) is very conspicuous, its tall, graceful white spikes often six inches long and three-quarters of an inch thick.

One of the most interesting among the flowering shrubs is *Crataegus coccinea*. We find two specimens near the road, one in full bloom, the other in fruit. The great bunches of large white flowers are a relief from the brilliant coloring all around us.

Above all this gay wild garden are some picturesque old White Oaks, their young pinkish leaf-buds and small gray leaves as beautiful as the flowers which run riot at their feet. The wind that sweeps unhindered over the ridge has twisted their branches into all sorts of fantastic shapes, and

the old lichen-covered trunks gleam white and silvery through the thickets of bright-colored Azaleas all around them.

In a little rill near the hotel, the tall, rather ungainly Lettuce Saxifrage (*Saxifraga erosa*) grows in the water, and in the adjoining marshy ground are the conspicuous triangular bright blue flowers of the common Spiderwort (*Tradescantia Virginica*). *Parnassia asarifolia* was found on old logs in the lake, but it was too early for the flowers, as well as for those of *Trautvetteria palmata*, which, in company with the green-flowered *Veratrum viride*, fills the deep bog along Little Stony Creek, the outlet of Mountain Lake, with a coarse, rank growth.

Magnolia acuminata is still in bloom on the borders of this swamp, and fills the air with the delicious fragrance of its large cup-shaped flowers, and all through the surrounding woods we found the curious *Conopholis Americana* in all stages of flower and fruit. The Striped Maple (*Acer Pennsylvanicum*) is dropping its small pretty racemes, and at its foot, growing all along the top of a decayed mossy log, are the dainty white flowers of *Tiarella cordifolia*.

These great logs, principally Hemlocks, overgrown with Moss and Fern, are the remains of what must have been a magnificent forest, for enough of them are still standing to bear witness to their former grandeur. In this jungle we find our third Trillium, the stiff, dark reddish *T. erectum*, and that curious vine, *Aristolochia Siphon*, which twines over rock and shrub, the queer, though hardly pretty, brown flowers really looking like so many little pipes among the large roundish leaves.

Both *Menziesia globularis* and *Vaccinium erythrocarpon* grow along the road over which we drive to the Cascade, five miles away, when we leave Mountain Lake on our way to the New River Valley. The falls are charming and the beauty of the ravine well repaid us for the rough climb we had to reach it.

There on the high cliffs we again found *Asplenium montanum*, but this time with feathery fronds three inches long, and we gathered *Cornus alternifolia* almost in the spray of the cascade. Two more members of the Birthwort family, *Asarum Canadense* and *A. Virginicum*, grew there in the deep Hemlock woods.

Gillenia trifoliata is another graceful white-flowered plant that has a place in the flora of Salt Pond Mountain, and such snowy clusters of the Deerberry's (*Vaccinium stamineum*) delicate little bells are surely rarely seen. In the woods near the foot of the mountain we found a small group of the pretty blue Scullicaps, *Scutellaria saxatilis*, *S. serrata* and *S. nervosa*, all growing not far from each other. Among the roadside trees *Tilia heterophylla* and *Magnolia acuminata* are prominent with many Oaks, and here and there are large clumps of the long, dark green leaved *Æsculus flava*, the latter with swarms of bees around its fragrant spikes of yellowish blossoms. Some of the larger trees are dying by inches in the fields, for the way of making clearings down there is essentially a lazy one. The underbrush is burnt or cut out, grain is sown, the trees are girdled and left to fall when and where they will. How any harvesting is done in such fields is a mystery to the uninitiated.

Our twelve-mile drive over an unspeakably rough road in wagons guiltless of springs came to an end at Eggleston's Springs, on the New River, where in a rather comfortless inn we spent the night.

New York.

Anna M. Vail.

New or Little Known Plants.

Schubertia grandiflora, Mart. and Zucc.

THIS species, which has recently been brought into notice in England, was first discovered by Martius some seventy years ago in the forests of eastern Brazil. A species much resembling this, but with rather smaller flowers (*S. graveolens*), has been occasionally cultivated for nearly fifty years, but has not received much attention. Like the very similar *Stephanotis floribunda*, it is a woody climber of the *Asclepias* family, with milky juice, and bearing umbels of large fleshy flowers in the axils. The leaves and branches are rather thickly covered with coarse brown hairs, and the bark upon the older stems becomes thick, white and corky. The flowers are pure white (becoming creamy) and extremely fragrant, and are very persistent, retaining their freshness for several days after being cut.

The plant is readily propagated either by seeds or cuttings, and is a rapid and vigorous grower, attaining a

length of twenty or thirty feet in the course of a year, and continuing in profuse bloom for several months. It bears a dry fruit of the size and shape of a small pear, covered with scattered fleshy spines, and containing numerous plumed seeds like those of the Milkweed. The leaves have a somewhat fetid odor, especially when bruised, which is the only thing that detracts from its value for floral purposes.

The genus *Schubertia* has been united by Bentham and Hooker with *Physianthus* under the older name of *Araujia*, but continental botanists still keep it distinct, perhaps more correctly. It is very closely allied to the "Condurango" which some years ago had an artificial reputation as a remedy for cancer.

The plant from which the figure here given was made was raised from seed planted in the spring of 1889 by Mr. John N. Gerard, of Elizabeth, New Jersey, and is now in possession of Mr. John Thorpe, of Pearl River, New York. The vine is now twenty-one feet long, trained horizontally, and covers a space three feet wide. It is flowering profusely both on leaders and laterals, the number of trusses being about 160, with from five to nine flowers in each cluster.

S. W.

New Orchids.

TRICHOPILIA PUNCTATA, Rolfe, is an elegant little species, allied to *T. laxa*, but the segments spotted with reddish purple, an unusual character in the genus. It was introduced from Costa Rica by Messrs. F. Sander & Co.—*Gardeners' Chronicle*, February 22d, p. 227.

CYPRIPEDIUM × CENONE, Rolfe, is a hybrid raised by Messrs. F. Sander & Co., from *C. Hookeræ* fertilized with the pollen of *C. superbiens*. The leaves are much like the former species, while the flowers have more of the character of the latter. The only plant saved is now in the collection of Mr. R. H. Measures, of Streatham.—*Gardeners' Chronicle*, March 1st, p. 260.

XYLOBIUM COLLEYI, Rolfe. This is the old *Maxillaria Colleyi*, Lindl., described in 1838, and which has long been lost to cultivation. A plant sent from the Trinidad Botanic Garden to Kew proved on flowering to be this species. Its native country still remains doubtful. It bears short racemes of reddish brown flowers, which smell like cucumbers, but are of little beauty.—*Gardeners' Chronicle*, March 8th, p. 288.

DENDROBIUM × ASPASIA, Veitch, is a beautiful hybrid raised by Mr. Seden for Messrs. James Veitch & Sons, from *D. aureum*, fertilized with the pollen of *D. Wardianum*. It was awarded a first-class certificate by the Royal Horticultural Society on March 11th. It is the plant described in the *Gardeners' Chronicle* for April 20th, 1889, p. 490, as *D. Wardiano-aureum*. The lip is very richly colored.—*Gardeners' Chronicle*, March 15th, p. 336.

CYPRIPEDIUM × NUMA, Veitch. A hybrid raised in Messrs. James Veitch & Sons' establishment from *C. Lawrenceanum*, fertilized with the pollen of *C. Stonei*. It has much of the general character of the pollen parent. It was awarded a first-class certificate by the Royal Horticultural Society on March 11th.—*Gardeners' Chronicle*, March 15th, p. 336; May 17th, p. 608.

CYPRIPEDIUM × OTHELLO, Veitch. A hybrid exhibited by Messrs. James Veitch & Sons at the meeting of the Royal Horticultural Society on March 11th. Its parents are *C. hirsutissimum* and *C. Boxallii*. Thus it must stand very near *C. × Godseffianum*, which has the same or the reversed parentage.—*Gardeners' Chronicle*, March 15th, p. 336.

ZYGOPETALUM (≠ BOLLEA) WHITEI, Rolfe, is a new species allied to *Z. hemixantha*, with cream-white flowers and a golden yellow disc. It is a native of New Granada, and was found growing with *Cattleya Mendeli*, by a collector of Mr. R. B. White, of Arddarrock. It is said to be a free grower, and the flowers are very pretty.—*Gardeners' Chronicle*, March 22d, p. 354.

ODONTOGLOSSUM WATTIANUM, Rolfe, is a very distinct form somewhat intermediate in character between *O. luteo-purpureum* and *O. Lindleyanum*, though whether it is a natural hybrid between them or a distinct species still remains doubtful. The flowers are yellow, blotched with maroon. It was introduced by Messrs. F. Sander & Co., of St. Albans.—*Gardeners' Chronicle*, March 22d, p. 354.

LÆLIA-CATTLEYA × HIPPOLYTA, Veitch, is a most beautiful hybrid raised from *Lælia cinnabarina*, fertilized with the pollen

Fig. 48.—*Schubertia grandiflora*.—See page 368.

of *Cattleya Mossiae*. The color of the flower is a beautiful Indian yellow, much like that of *Lælia + flammea*. It was awarded a first-class certificate by the Royal Horticultural Society on March 26th.—*Gardeners' Chronicle*, March 29th, p. 398, and April 5th, p. 431.

DENDROBIUM MIRBELIANUM, Gandich., is a very interesting species from New Guinea, which has been known to science for upward of sixty years, and has now been introduced to cultivation by *L'Horticulture Internationale*, of Brussels. It is a robust species with long, erect racemes of yellowish green

flowers, with a few purple-brown spots on the segments and lines on the lip.—*Lindenia*, vol. v., p. 49, t. 215.

MASDEVALLIA LOWII, Rolfe, is a pretty little species belonging to the Saccilabiate section, which was introduced from the Cauca, New Granada, by Messrs. Hugh Low & Co., of Clapton. It is readily distinguished from its allies by its shallow, maroon-purple lip, which is unusually fleshy and almost filled up with the keels so characteristic of this section of the genus. The sepals are also narrower than usual below, and gradually attenuated right to the apex.—*Gardeners' Chronicle*, April 5th, p. 416.

Kew.

R. A. Rolfe.

Plant Notes.

Hypericum Kalmianum and *Lobelia Kalmii*.

THIS is the season of *Hypericum Kalmianum*, whose yellow blossoms seem more than usually profuse the present year. Large patches of them may be seen covering the ground along the borders of the sloughs throughout the sand region at the head of Lake Michigan, for it is under such conditions that it flourishes here. The excellent figure and description of it in GARDEN AND FOREST for March 5th leads me to send some account of this plant and another one named after Peter Kalm, both of which are common near the shores of Lake Michigan in the sandy region just south and east of Chicago. One gets the impression from the habitats assigned in most of the hand-books of botany, that they are quite exclusively denizens of the rocks; but they flourish equally well in the damp silicious sands. The first named will also bear a considerable amount of dryness. It is not confined to the lake shore, though abundant in many places on the landward side of the ridge of sand usually fringing the shore, and against which the surf may beat when the waves run high. It sometimes spreads two or three miles away from the shore, growing along the borders of sloughs and sluggish streams. It may be found in company with our only shrubby *Potentilla*, *P. fruticosa*, though the latter can endure wetter conditions of soil, the lower part of the stems being under water sometimes, but not, apparently, as a permanent state. Such shrubs as *Pyrus arbutifolia*, *Cornus paniculata* and *C. sericea*, and the Willows *Salix lucida*, *S. glaucophylla* and *S. adenophylla*, often accompany it. The last is quite peculiar to the shore, seldom getting away from it, and is generally found higher up the slope of the sand ridge or on its top. I have found *Hypericum Kalmianum* in the same situations as *H. Canadense* and *H. gymnanthum*. Other plants growing along with it are *Linum Virginianum*, and *L. sulcatum*, *Castilleja coccinea*, *Tofieldia glutinosa*, the beautiful Gentian, *Sabbatia angularis*, and the two pretty Orchids, *Pogonia ophioglossoides* and *Colopogon*—each, of course, in its season. This partial list, which might be considerably extended, will serve to show that it is not very exclusive in its habits, for some of the plants mentioned are usually regarded as wet or damp-ground and some as dry-ground species. And it may also in a measure explain why this *Hypericum* is so easily cultivated, as well as the other species of the genus, since they readily adapt themselves to varying conditions. I should think, however, that a light soil kept reasonably moist would be nearest to their natural state. Some years ago I came across a patch of this plant in one part of the city that was at the time under improvement as a park. It had evidently been brought by accident among the roots of a White Pine which had been planted near by. The ground was sandy and quite dry, but the shrub was strong and doing well. I may add that *H. Kalmianum* is quite commonly distributed along the sandy shores of Lake Michigan, probably throughout its whole extent. The place where I have seen it farthest from the lake was on the rocks at the sandy Portage of the Menominee River, in the northern peninsula of Michigan. This is a little below Iron Mountain, or about fifty miles up the river from Green Bay, into which the Menominee flows.

The other plant named for Peter Kalm, *Lobelia Kalmii*, probably gathered by him at Niagara Falls, where it grows upon the rocks, as I have taken it from the Three Sisters Islands, is also common here. It is not confined to the "wet limestones," but does just as well in the damp sands, and sometimes assumes neighborly relations to *L. spicata*, abundant here in open sandy ground. A similar list of mingled plants might be made out for this, as in the case of *H. Kalmianum*, though I find it a little more confined to the wetter ground. In fact, an extended article could be prepared from material furnished by the mixed character of the flora of the upper lakes, especially that near the south end of Lake Michigan, interesting to the botanist, meteorologist, and doubtless profitable to the horticulturist, showing how plants in their

wild state readily adapt themselves to changed conditions, and I have often been surprised to find many strange neighbors among plants. In Michigan the habitats of plants differ widely from those set down in the books, especially when these wet, sandy grounds are drained as they come to be by the demand of the growing population of a large city. Having seen this go on for nearly a score of years, the opportunity has been very favorable to study this struggle for existence. While the original soil is left undisturbed by the plow or spade, the wet-ground and the dry-ground plants suit themselves to the altered surroundings, the latter coming in among the former, and as cosily occupying the same quarters as though they had never lived apart. Some are devoid of the requisite flexibility of constitution and yield to the inevitable, but many more soon come into permanent relations with a new environment.

Englewood, Ill.

E. J. Hill.

Cultural Department.

Notes on Shrubs.

PROBABLY there is no species among the late flowering *Spiræas* in cultivation which would rank higher as showy ornamental shrubs than *Spiræa discolor* and its varieties. This species is a native of several of the states in the Rocky Mountain region, and it extends from southern California into British Columbia. Although long known it is seldom seen in gardens in this country; but, in the northern and New England states, this may be partly due to the fact that the plants generally do not withstand the severe winters without some artificial protection. *S. discolor*, var. *ariaefolia*, or, as it is more often called, *S. ariaefolia*, is very unequal in its behavior at the Arboretum. It has seldom flowered so well as it has this season, a circumstance partly due, no doubt, to the past mild winter, and to the stems having been bent over and carefully, though lightly, covered with soil.

The tallest stems have attained a height of eight or nine feet, and all have been well laden with numerous large, loose spreading panicles of creamy white or straw colored flowers. The panicles bear some resemblance to those of the common Siberian *S. sorbifolia* of our gardens, but they are not so large and have a more feathery and less stiff and formal appearance. Besides this, they differ in being produced on a number of lateral branches along the main stems, whereas the panicles on *S. sorbifolia* are erect, solitary and terminal.

The two species bear no resemblance to each other in habit or in general appearance, and if it was perfectly hardy *S. ariaefolia* would be considered the most valuable, both for its blossoms, and because it may be very easily kept as a neat, trim bush, and does not spread and encumber the ground by suckers.

Under cultivation at the Arboretum the panicles of flowers average about six inches in length by four inches across, but some are nine or ten inches long, with a diameter of from six to eight inches. The individual blossoms are small, about a fifth of an inch across, and they are light creamy white in color. The odor has been described as like that of Sweet Birch, yet to many people it is more strongly suggestive of honey. There is also a suggestion of the odor of Chestnut-blossoms, which lends a slightly disagreeable quality.

In its native habitat the shrub is said to grow from five to fifteen feet high. In well sheltered situations in southern New England it would probably rarely fail to blossom abundantly, and some hardier strains than that grown at the Arboretum may yet be procured. The flowers are of short duration, but, as all the panicles do not develop their blossoms simultaneously and some plants are a little later than others, a good show of bloom is kept up for three weeks after the opening of the earliest blossoms—about the 1st of July.

Spiræa Millefolium, which was figured on p. 509 of the second volume of GARDEN AND FOREST, blossoms at the same time as, or a little later than, the last species, and although more interesting in many ways it has little merit as a conspicuous or decorative shrub. The specimens in the Arboretum were produced from seed collected in Nevada and they have proved very hardy without any protection. They are, however, of straggling habit, though upright, and only three or four feet in height. The foliage is not sufficiently abundant to hide the naked lower portions of the branches and stems. The narrow, finely twice-pinnate leaves distinguish this species from all others of the genus. Another peculiarity of the leaves is that a very well developed tuft of them remains on the tip of each branch throughout the winter, and these leaves continue their growth with the new shoots in the spring.

The panicles of flowers are not produced in much profusion. They are from two or three to four or five inches long, and are borne on the extremities of a few of the strongest shoots. The petals are of a rather pale white color and the expanded flowers are nearly half an inch across. But as not one-half of the blossoms in a panicle are open at any one time they are not so showy as they otherwise might be. The fragrance of the flowers reminds one of the odor of the common Yarrow, though the latter is much less powerful, while that of the leaves and whole plant has been likened to creosote and also suggests burning sealing-wax.

This species and *S. discolor* have so many characters peculiar to themselves that some systematists place them in separate genera as being quite distinct from the true *Spiræas*.

In *Spiræa Douglasii*, another species from the western part

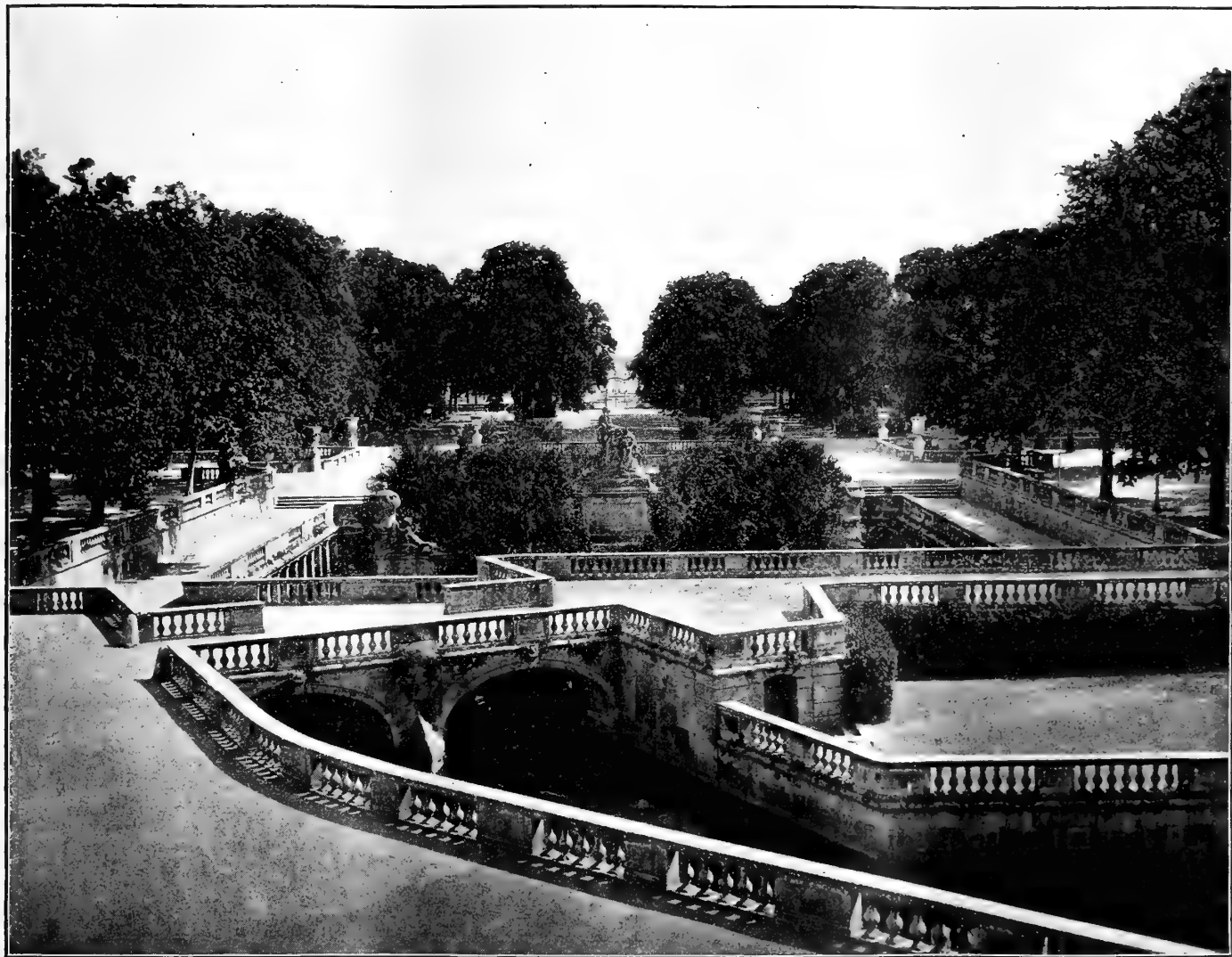
well known Japanese *Spiræa callosa* and many of its forms come under this class, but they are valuable because they keep up a succession of blossoms for several weeks.

Arnold Arboretum.

J. G. F.

Notes on American Plants.

WE have in New England three native Sundews (*Drosera*) which flower about this season. They are all small species, generally classed among the carnivorous plants, and this curious characteristic is one of their chief points of interest. Yet the largest of these, the Thread-leaved Sundew (*Drosera filiformis*), has numerous handsome rose-purple flowers half an inch wide in a one-sided spike. It is seldom more than a foot high. The very long, thread-like leaves are covered with their



Roman Baths, Gardens of the Fountain, Nîmes.—See page 366.

of the continent, we have a plant which nearly corresponds to our Hardhack or Steeple-bush (*S. tomentosa*). Except for the slightly larger size of the panicles of its flowers, which may also sometimes be a little deeper in color, *S. Douglasii* possesses few qualities to make it of any more ornamental value. The plant is of larger, coarser growth, and the leaves are also larger but not so neat and attractive as those of the common Hardhack, which also bears neater, much more pointed and more symmetrical panicles of flowers.

The variety of *S. Douglasii* known in nurseries as *S. Nobleana* chiefly differs from the typical species in having the flowers arranged in panicles which are broad and spreading instead of narrow and pyramidal. The very short duration of the flowers and the fact that those on the upper portion of the panicles usually become an ugly brown sooner than the lower or outer blossoms is a serious drawback to the beauty of these and some other deep pink or rosy purple flowered species. The

glandular bristles, and the sticky gluten which exudes from them catches many an unfortunate insect that comes within reach of it. In fact, the leaves are often almost hidden by its little victims. This species has been found near the coast at Plymouth, Massachusetts, and thence southward to New Jersey and Florida.

Our most common species, the Round-leaved Sundew (*D. rotundifolia*), is a more delicate little plant, with round leaves on spreading petioles which lie quite near the ground. The flower-stem is seldom more than eight inches high, bearing several small white flowers. It is very common in peat-bogs and wet sandy places throughout New England.

The Long-leaved Sundew, formerly called *D. longifolia*, but now known to botanists as *D. intermedia*, var. *Americana*, is not so common, but grows in bogs, in wetter places, and might almost be called an aquatic. In its general appearance it much resembles the preceding, and it has similar white

flowers. All of these Sundews are easy to grow, but the first, when brought from as far south as Florida or Georgia, might not endure our cold winters without protection. They thrive well in a wet sandy soil with the Venus' Fly-trap and such *Sarcenias* as are found in sandy bogs.

The common Floating Heart (*Limnanthemum lacunosum*) is a valuable little aquatic, and is especially adapted for small aquaria. Its round, heart-shaped leaves, usually a little more than an inch long at this season, are of a reddish purple shade and variegated with a greenish centre. The several small white flowers are a third or half an inch wide on thread-like petioles, which come from about an inch below the leaf. They succeed each other in long succession, and, like the leaves, float on the surface of the water. It is a native of shallow ponds from Canada to Florida.

The value of our native white Water Lilies for cool waters cannot be too highly estimated. The sweet-scented one, *Nymphaea odorata*, is already too generally known to need any mention. Its variety, Minor, with smaller leaves and flowers, is also a desirable plant, and may be grown with it in similar situations. The largest of our Water Lilies, *N. tuberosa*, is not so generally known. It is a larger and stronger plant, and when given an equal chance bears larger and handsomer flowers—nearly a third larger than *N. odorata*. The leaf is also a third larger, not rarely fifteen inches wide. The flower, though not so strongly scented as the other, has a delicate and delicious odor peculiar to itself, and it remains open later in the day after those of *N. odorata* have closed. Both sides of the leaves of *N. tuberosa* are green, while in all the plants of *N. odorata* I have seen the under side of its leaves were of a reddish purple color. The pinkish color of the sepals, so common in *N. odorata*, is said to be always lacking in *N. tuberosa*, and the small tubers, which are so numerous in *N. tuberosa*, attached to the main root-stalk, are lacking in the other.

There are other handsome species native to North America, such as the *N. flava* of the southern states, with yellow flowers, the beautiful blue flowered *N. elegans* from southern Texas and Mexico, and the *N. ampla* and *N. gracilis*, but none of these thrive in our cool, clear waters of New England. Even in the hottest summer weather, such as the present season affords, they only manage to exist, sending up a few weak leaves with no promise of flowers.

One of the most attractive little plants of the Heath family, and which is now in flower, is the Spotted Wintergreen (*Chimaphylla maculata*). The plant is seldom over six or seven inches high, and bears four or five nodding, white, deliciously fragrant flowers, three-fourths of an inch wide. The ovate-lanceolate leaves are dark green, variegated with a lighter centre along the middle the whole length of the leaf. It is a difficult species to transplant, and the only way is to take up large sods and set in a fine shaded soil.

The White Fringed Orchis (*Habenaria blephariglottis*) is just beginning to bloom. It is one of the rarest and most desirable species we have. It grows in bogs and on borders of ponds, usually only a foot high, with oblong-lanceolate leaves, and at the summit a short, round spike of pure white flowers. It is a good plant for artificial bogs, and blooms a little before *Habenaria psycodes*, when flowers are few.

Aletris farinosa (Star Grass) has its leaves in a cluster close to the ground, from among which comes a long, slender, naked scape, two or three feet high, bearing a wand-like raceme of pretty white flowers. The spike or raceme is about three-fourths of an inch in diameter and five to eight inches long. It is useful for cutting. The plant is not rare, and may be easily grown in the sun or shade in a sandy soil.

Silene stellata, Starry Campion, sometimes called Colic Root, is an attractive plant when in bloom. Its numerous flowers are three-fourths of an inch across and pure white. The petals are cut into a fringe, which adds to its beauty. The stems are two or three feet high and rather weak at time of flowering, for the stalks with flowers are usually bent down. The taper pointed, narrowly ovate leaves are in whorls of four at considerable distances apart along the stem. It is a native of wooded banks from Rhode Island to Wisconsin and southward. Although it grows in shade or partly shaded situations it seems to thrive equally well in the sun.

The Bristly Sarsaparilla or Wild Elder (*Aralia hispida*) is not a showy plant. The stems, which are a foot or two high, are bristly, with a moderate amount of foliage, and terminate in a head bearing several hemispherical umbels of greenish white flowers. Its best season is when in fruit and it bears an abundance of dark berries much resembling those of the common Elder. It grows in rocky places, also on dry sandy soil, and does fairly well in either sun or shade.

Southwick, Mass.

F. H. Horsford.

Cinerarias.

CINERARIAS are among the most useful and showy plants for the embellishment of the conservatory and greenhouse during the winter and spring months. They are easily managed, too, but are seen much more rarely than they deserve, and still more rarely grown up to the recognized standard of a florist's flower. One great drawback to the successful cultivation of Cinerarias in the United States is that growers follow the cultural notes given in European periodicals and catalogues. Rules which ensure success in England would bring disaster if strictly adhered to in this country, and yet these plants can be grown successfully by every one who can command an ordinary garden frame and a greenhouse from which frosts and excessive damp can be excluded.

Cinerarias are classed as greenhouse perennials, and many varieties are grown as such in Europe and propagated by offshoots after flowering; but the difficulty here is that the plants cannot survive our summer sun and heat. This fact must also be borne in mind by those who treat them as annuals. Plants from seed sown in May and June lack the vigor of later sown seedlings, and this is a vital point in cultivation. Seed of an extra good strain should be obtained from a reliable source, and two sowings made; the first from the middle to the latter end of July, with another about three weeks later. The seed should be sown in pans or shallow boxes upon light sandy soil, moist, but not wet, and they should be covered lightly with finely sifted soil. A cold-frame, pitched north, with sashes shaded and a bed of coal ashes two or three inches thick, makes a good place for seed-pans, as well as for the seedlings in all stages of growth, if no other suitable structure can be commanded. The seed-pans should be covered with glass or paper to prevent evaporation during the day, but the glass must be taken off for some time daily, as the close atmosphere will help the development of bench-fungus, which will destroy the seedlings before they can be safely handled. I prefer to cover the pans during the day and leave them uncovered at night. In watering seed-pans a fine rose watering-pot or a rubber sprinkler should be used. When the seedlings are large enough to handle, prick them off into shallow boxes and return them to the frame, where they should be constantly, but discreetly, ventilated. Newly pricked off or potted plants must be kept somewhat close for two or three days after shifting or the plants may flag, a result to be avoided always; and yet the night air is beneficial. Keep a sharp look out for slugs and snails, as the tender seedling is a tempting morsel, and if one slug can reach a plant at this stage it is gone. Young toads also like to bury themselves in the cool sandy seed-boxes, not to the benefit of the plants.

As soon as the plants are large enough, and before they get crowded in the boxes, pot them off singly into three-inch or three-and-a-half-inch pots, using well decayed sod and rotted cow-manure or manure from a spent hot-bed. The soil should be rubbed through a sieve of half-inch mesh with sharp sand, broken charcoal or coal ashes to keep it porous. The pots must be clean and well crocked for drainage. Care must be taken in handling the young plants from the seed-pans that a leaf is not broken or the tender roots bruised by pressing the soil too firmly into the pots. The plants may be lifted with a stout label with as much soil as will adhere to the roots, and should not be planted too deeply or they may rot off. As soon as the plants have partly filled the pots with roots they should be shifted into five-inch and six-inch pots. In the latter size they may be left to bloom, but those in the smaller pots will need another shift. Use the same soil as at first potting; give a light sprinkle of bone-meal and place the pots once more in the cold-frame, giving attention to shading, watering and ventilation.

As the plants advance in growth those in five-inch pots may be shifted into pots two or three sizes larger, using the same compost as before; those in six-inch pots should receive weak liquid manure once a week, and the application should be increased in strength and frequency as the plants require watering, until every second watering is with liquid manure. Give each plant abundant room for developing its foliage, and use every possible means to keep the foliage clean, healthy and vigorous. During hot and dry weather a light sprinkling overhead will greatly assist them. As autumn approaches every precaution must be taken against frost, but the plants should not be hurried into the greenhouse, for mild weather is often experienced after a light frost or two.

The Cineraria dislikes sun heat and fire heat and extremes of temperature, and when it is necessary to bring the plants into the greenhouse place them in the cool house, giving air on all favorable occasions, but guarding against cutting draughts of cold air, a glaring sun and a dry atmosphere. A

mean temperature of forty-five degrees should be maintained, and, if kept cool, Cinerarias are seldom troubled with insects. In heated structures they soon become infested with green fly. A mild fumigation with Tobacco-stems should be given weekly as a preventive, for if green fly is not kept off the plants the flowers will not be worth seeing. The plants should be kept growing steadily and rapidly from the seed until they flower. This is essential, and therefore they should be kept clean and healthy, and should never be allowed to become dry, starved or pot-bound.

Staten Island.

W. T.

The Vegetable Garden.

EACH year's experience with the little Bush Lima Bean sent out last year by Peter Henderson & Co. confirms my first impression of its great value; and I had an opportunity to observe it before its dissemination. This Bush Lima is a variety of the Small Lima Bean, and it originated in Campbell County, Virginia. Its small size was a disappointment to many who bought it for the first time, but its earliness, remarkable productiveness and good quality will atone for this. It is a well known fact in the south that the old large Lima is very unproductive anywhere south of the Potomac, and the small Lima, known south as the "Butter Bean," has always been a favorite sort here. The Small Bush Lima ought to be a favorite in the north, on account of its earliness, which prolongs the season for this delicious vegetable. Here in Raleigh we can have the Bush Lima in abundance by the middle of June, nearly a month earlier than the large pole Lima is ready, and the same difference will probably hold good at the north. This season a pint of these beans planted in my garden has given an abundant daily supply to a family of twelve persons since the middle of June, and as I write (July 19th) there is no let up in the blooming and pod-making. I believe now, though disposed to doubt it at first, that a larger yield per acre can be had from the bush than from the pole bean of the same species. This will be accurately tested at the Experiment Station here next year.

Flat Strap Leaf Turnips for family use should not be sown too early. These Turnips, when in perfection, which is only in autumn, are the sweetest and best for table use. They should, however, be grown almost as rapidly as radishes to be good. If sown too early in highly enriched soil they grow large and pithy and are not so sweet. The middle of August at the north is early enough, and a month or more later in this latitude is better. The seed should not be sown broadcast. We usually open furrows with a plow, when they are grown on a large scale, about two and a half feet apart. In these furrows a heavy dressing of superphosphate is sown and a light furrow turned from each side over the first one, forming a sharp ridge. A roller is then run over the ridges lengthwise, flattening them nearly to the soil level. The seeds are then sown with a drill on the flattened ridges, and over the fertilizer.

The black flea beetle (*Haltica*) attacks them as soon as they germinate, but a dusting of air-slaked lime will usually expel them. If the lime alone is not sufficient, use a very small portion of Paris green, say one-half of one per cent. of the whole.

The Chinese Rose Colored Winter Radish can also be sown in the same way and at about the same time, or, better, a little later. In this latitude these are best when sown the last of September, and a second sowing can be made later still if the first ones promise to be too large. We leave them to stand where they grow for winter use protected only by the Chickweed, which here mats over every fertile spot in winter. Even in the north I think they might be left where they grow and covered with a heavy coat of straw or forest-leaves. They keep well in moist sand in a cool cellar.

The earthing-up of Celery should not be begun too early, except of a little for fall use. Celery earthed and blanched in hot weather is not usually a good article. Whenever the winters are not too cold the bed system practiced around Baltimore is best. These beds are six feet wide by any length, and the plants are set in rows across the bed a foot apart and six inches in the rows. The whole bed is earthed up en masse and finally covered with forest-leaves, and the plants are allowed to stand where they grow. Celery grown in these beds has a crispness which is not found in Celery that is lifted for storing in winter. Even at the north Celery could be kept if a rough board roof were thrown over the banked base and then covered with straw to exclude the frost.

The dwarf Celeries are best at the north, but south of the Potomac the half dwarf and the old large sorts are the best. In this latitude our chief difficulty is to get it to stop growing. Last winter being unusually mild, our Celery nearly all ran up to bloom and seed in midwinter.

The practice of growing a late fall crop of Irish Potatoes, I believe, is destined to extend not only in the south, but a good deal further north than the experiment has hitherto been made. Years ago, even in the south, a late crop of Irish Potatoes was a very uncertain matter. But we have learned how to grow them here with certainty, and by the use of southern prepared seed Potatoes the planting could be extended with profit northward. The best practice here is to take Potatoes of the early crop and spread them out in a light shed until well greened by the light. These are then bedded on a piece of mellow ground in beds of any convenient width about the middle of July, the Potatoes being laid just so as not to touch each other. The bed is then covered with two or three inches of soil, and left until planting time, which is here from the middle to the last of August. By this time all the immature potatoes will have rotted or dried up, and the good ones will be well sprouted. These are then planted in shallow furrows, without cutting, and covered with not more than two inches of soil above the potato. The earth is packed to them with a roller, and in the after culture more soil is drawn to them. Growers in the latitude of Philadelphia, by taking these southern grown potatoes and planting in the middle of July, could, I feel sure, raise a fine crop. They should plant the seed potatoes much more thickly, to allow for the rotting, which we do in the beds. The chief point to observe is to cover these late planted potatoes very lightly. Deep planting at this season will always give a bad stand. Southern potatoes, well greened, could be shipped at low rates, since the cuttings of the early crop are the ones generally used.

Agricultural Experiment Station, Raleigh, N. C.

W. F. Massey.

The Dewberry.

IN the issue of GARDEN AND FOREST for July 9th Mr. Jack writes: "In a wild state the fruit (of the Dewberry) is very variable in size and flavor, but by selection and under cultivation it is possible to produce berries which, for size and flavor, cannot be distinguished from some of the best blackberries."

One would infer from this paragraph that the dewberry at its best is equal in point of size and quality to the best blackberries, a statement which does scant justice to the delicious, melting juiciness of the dewberry. To my own taste this fruit is surpassed in quality by the strawberry alone.

Except in form and color the dewberry differs nearly as much from the blackberry as from the raspberry. Its time of maturity is between the two, being at its best just as the raspberries are failing and before the blackberry-season has really commenced.

The Dewberry does not succeed well in all localities. In my first trials, which were with Bartell's and the Mammoth varieties at Geneva, New York, the plants were quite unproductive, and the fruits filled out very poorly. In the summer of 1889, however, I saw a plantation of Bartell's Dewberry on the farm of Hon. H. C. Adams, of Madison, Wisconsin, that convinced me in a moment that there is a future for this fruit. The vines were well loaded with the beautiful, glossy berries, many of which were nearly or quite two inches in length, and by the side of them the finest blackberries appeared commonplace indeed. And they were superior in taste as well as in appearance. Mr. Adams told me that he had no difficulty in securing several cents more per quart for them than for blackberries.

There is certainly a promising field for work in the improvement of the Dewberry. Seedlings of it may be grown with the greatest ease, and require but a short time to come into bearing. The difficulties of cultivating this fruit are little greater than in the case of the Strawberry. The fact that the stems are trailing is an advantage in cold climates, as they are the more easily protected in winter and are more likely to be sheltered by snow. One grower mentioned the fact that the vines of the Dewberry form a natural hiding-place for serpents, and in localities where these abound he has found difficulty in inducing timid pickers to gather the crop.

University of Wisconsin, Madison.

E. S. Goff.

Erpetion reniforme.—This pretty little Australian Violet will not prove hardy in the colder states, but any one who has the protection of a greenhouse to give it in winter will be delighted with the abundance of modest little blue and white flowers all through spring and summer. Our plants were raised from seed sown in October last, and kept in the greenhouse all winter, where they commenced to flower in April. The plants form numerous creeping stems, from which come a dense mass of small green leaves, and flowers on stems about two inches high. These latter resemble other Violets, except

that the inner half of each division of the flower is blue and the other half white, giving them a distinct beauty of their own. *Erypetion reniforme* is the name usually given the plant in seed lists, though there are several synonyms, the most common of which is *Viola hederacea*. This plant would be desirable for carpeting the flower border in summer, but owing to its delicate habit it should not be set among coarse-growing plants or in dry places, and for growing in pans it cannot be over-praised.

Californian Lilies.—So far as I have tried these lovely Lilies, in all sorts of soil, in sun and shade, in open ground and in frame, *L. Washingtonianum*, *L. Humboldtii*, *L. Columbianum*, *L. rubescens*, *L. parvum* and *L. maritimum* have all been most unsatisfactory garden plants. There must be some conditions necessary to their successful culture that are yet insufficiently known, and I am tempted to ask if any readers of GARDEN AND FOREST have been able to succeed with these beautiful western Lilies for any length of time. *L. pardalinum*, when not affected with disease, grows here in Massachusetts often five feet high, with a beautiful display of its spotted flowers. That this Lily should do so well, and the other kinds so indifferently, requires a little explanation from those who are familiar with the plants and their natural surroundings.

South Lancaster, Mass.

E. O. Orpet.

Nymphæa rosacea is another of Monsieur Marliac's introductions well worth growing. It is apparently a variety of *N. odorata*, which it resembles in habit and foliage. The flowers are a light, clear rose or pink, in form and size like the type. Compared with *N. odorata rosea* (the Cape Cod Lily) the color is much more delicate and less decided. *N. rosacea* will prove a charming addition to any collection.

Nymphæa pygmæa alba (*tetragona*), the smallest of the Water Lilies, is a native of western China and Siberia. Owing to its diminutive size it may be grown in very limited space, the leaves being only three to four inches in diameter. The flowers are plentiful, white, about two inches in diameter, and of rather thin texture. Grown with other Nymphæas, in shallow water, they add variety, and their appearance is all the more dainty among the more robust growers.

Elizabeth, N. J.

G.

The Forest. The Sihlwald.—I.

IT was my good fortune recently to pass a month in the Sihlwald, as that portion of the forest-property of the City of Zurich is called, which stretches for some five miles along the narrow valley of the Sihl. It is not often that a forest is so favorably situated both geographically, and as to the conditions which determine the value and fertility of timber-lands; and while there are many peculiarities in its management which mark it as distinct from the great body of European forests, it exhibits so full a knowledge of forestry applied to such excellent conditions and so admirable an adaptation of means to ends, that if it fails of being typical of that which is, it may assuredly challenge attention as the illustration of that which ought to be. Further, since during the last fiscal year it yielded to the city a net revenue of more than eight dollars per acre, a short account of it may serve to emphasize the fact, so often lost sight of, that the protection of forests is not an end, but a means, and that the whole question of forestry has a very definite and important financial bearing. It has, therefore, seemed that a few words upon the Sihlwald might not be without interest to the readers of GARDEN AND FOREST, and I purpose, after describing it briefly in the present paper, and sketching the management of the forest in a second, to touch upon it in a final one as a piece of municipal property.

Situated about two miles inland from the western shore of the Lake of Zurich, and within an hour's drive from the city, the Sihlwald lies along, and for some distance fills, the valley of the Sihl. The stream from which the forest takes its name was once a dangerous torrent, but in the progress of the work on the more rapid water-courses, which has already cost the Federal Government eight million dollars and the canton of Zurich rather more than eight dollars per head of its inhabitants, it has been "corrected" into harmlessness. Walled in along a large proportion of its course, and with its drainage area protected by forests and the heavy turf of the Swiss pastures, it has abandoned its aggressive character to become the centre of the industry and prosperity of the valley which it waters. The soil of the valley has for its geological base a marly sandstone, overlaid, on the broad plateaus which break the moderate slope of the left bank, by a sandy clay of glacial origin, deep, rich, and with great capacity for holding water.

The opposite slope, much steeper, and, in consequence of its south-western aspect, more directly exposed to the action of the sun, is drier and less fertile. But since the whole valley of the Sihl, or at least that part of it which here concerns us, lying as it does between altitudes of 1,624 and 2,986 feet, enjoys an annual rainfall of fifty inches, it would be a mistake to speak of the right bank as dry and infertile, except in comparison with its richer neighbor. Both slopes are intersected by numerous small ravines, from which no fewer than forty rivulets find their way to the Sihl. But with the climate of northern Europe indicated by a mean temperature of forty-eight degrees Fahrenheit, and with the conditions of soil and moisture which have been mentioned, the exceptional productiveness of the Sihlwald would still remain partly unexplained, were it not possible to add that the land which it covers has been uninterruptedly under forest for something over a thousand years. That precious condition of the surface which the French and Germans unite in describing as "forest-soil," so slow in forming and so quick to disappear wherever the full sunlight is allowed to reach the ground, has here been produced in perfection by centuries of forest-growth. It is perhaps to this factor, next to the abundance of humidity, that the high annual yield of wood in the Sihlwald is due.

The growth which covers the soil thus fortunately suited to its needs is a mixed high or seedling forest, in which the deciduous trees largely predominate. Under the law of the rotation of forest-crops, not so well known as that which determines an analogous success in agriculture because it acts over vastly longer periods, the character of the mixture has undergone a gradual change, until, in the course of two centuries and a half, the percentage of coniferous trees has declined from sixty-one to fourteen, and the deciduous forest has taken their place. The composition of this last on a typical area of the Sihlwald may be taken to include eighty Beeches, ten Ashes, nine Maples and one Elm in every hundred trees. No exact data are available for the sixteen conifers which should theoretically find their place among these hundred broad-leaved trees, and it can only be said that they would stand thus: Spruce, Silver Fir, Scotch Pine and Larch, in the order of numerical importance. But it is to be remarked that the distribution of the different species is very far from being as regular as this statement would imply. While the mixture is in general rather one of individuals than of groups, still the various trees form each a larger proportion of the forest in those localities which best meet their requirements. Thus conifers replace the deciduous forest upon the dry slopes and sunny exposures of the right bank of the Sihl, and even considerable bodies of pure Spruce are to be met with. Nor does the Sihlwald, in spite of its large annual yield, convey the impression of a dense forest. The trees, cut soon after the period of maximum mean annual growth, commonly exceed a hundred feet in height at the time of felling, but so slender are they that it is rare to find a specimen of a greater diameter than two feet at twice that distance from the ground. The leaf-canopy, lifted on the straight, clean boles far above the beautifully kept paths, which it has been the policy of the Forstmeister to maintain, has none of the gloomy effect which a lower cover frequently produces; and the absence of underbrush and fallen branches gives a feeling of space and cultivation which is pleasant in the extreme.

Scattered along between this forest and the Sihl, are the houses of Forstmaster (Forstmeister) Meister and his assistants. Here, too, are placed the saw-mill, handle factory and injection plant, whose presence as integral parts of the equipment of the forest, chiefly distinguishes the management of the Sihlwald from that of other similarly situated European woodlands.

Nancy, France.

Gifford Pinchot.

Correspondence.

Experiments in Producing Rain.

To the Editor of GARDEN AND FOREST:

Sir.—"In certain villages in the Indian Central Provinces, besides the village blacksmith, the village accountant, the village watchman and the like, there is an official termed the Gapogari, whose duty it is to make rain. So long as the seasons are good and the rain comes in due time his office is, no doubt, a pleasant and lucrative one. It is not laborious, and it is obviously the interest of all to keep him in good humor. But if, as sometimes happens, the hot dry weather of April and May is prolonged through June and July, and week after week the farmer sees his young sprouting crops withering beneath the pitiless hot winds, public feeling is wont to be roused against the peccant rain-maker, and he is led forth and

periodically beaten until he mends his ways and brings down the much-needed showers."

This quotation from Blanford, the meteorologist, is used by a correspondent of the *Evening Post* to introduce the statement that the official position of Gapogari is to be established in this country. At least this may be inferred from an amendment by the Senate made in the appropriations for the Department of Agriculture.

Whether the methods of imposing the fine for non-performance are to be the same as in India I cannot surmise, but for the sake of the unfortunate official who is charged with the production of rainfall let us hope they are not. This much difference, at least, appears to be made, that the methods of producing rainfall are to be found by experiment, and not to be left to be a secret of the unreliable Gapogari.

There is in the appropriations for the Forestry Division a provision calling "for experiments in the production of rainfall," for which the vast sum of \$2,000 is set aside. One is inclined to think, at the first look, that this was inserted by some one desirous of breaking up the modest beginning of Government forestry interests by demanding proof positive and on the spot that forest and rain-fall have a relation to each other, but inquiry develops the fact that this is a bona fide proposition, and the experiments are expected to be made. Forestry has really nothing to do with it, for it is dynamite, guns, electricity or what not, that is to serve in the solving of the problem.

Senator Farwell, of Chicago, is referred to as the originator of this remarkable proposition, and he may have a special interest in the experiment. He is one of a syndicate who built the Texas state capitol, one of the finest and most substantial architectural works in this country. In payment, the state ceded to the syndicate 3,000,000 acres of land in the so-called Pan Handle, a region which for a large part is devoid of living water (except where the Canadian River traverses it), and which suffers also from deficient rainfall. Rain would make it bloom, for it is very fertile soil. Hence a Gapogari might prove a desirable officer in the Pan Handle.

If Mr. Fernow, the Chief of the Forestry Division, whose unfortunate task it will be to explode the clouds (or is he to furnish clouds, too, for \$2,000?) will be the most famous man of this century, if he succeeds in filling the position satisfactorily, and will not need to drudge at making forestry acceptable to the nation.

When asked about the matter he did not express himself very hopeful of success, and while admitting that the subject was not altogether devoid of legitimate inquiry, he did not think that our knowledge of physical forces and meteorological phenomena was as yet equal to the task, and he felt an unwillingness to try experiments without having investigated the basis for them. He said that the idea of producing rainfall artificially had been ventilated for a long time, and the hopeful expectation of solving the problem had been encouraged by the observation that cannonades on battle-fields or at celebrations (fireworks on a large scale), prairie fires or other extensive conflagrations were apt to produce precipitation for reasons well understood. But the application of this experience for practical purposes seemed questionable, especially in such parts of the country where there is no moisture to precipitate. An honest effort, however, will be made to arrive at least at a possible basis for such experiments, and to spend the money which, it was evident, the Chief of the Forestry Division would have preferred to use on the legitimate field of his division.

Washington, D. C.

M. C.

The Crandall Currant.

To the Editor of GARDEN AND FOREST:

Sir.—A late number of GARDEN AND FOREST contained some notice of this Currant in connection with the remarks upon new fruits by Mr. H. E. Van Deman, Pomologist of the United States Department of Agriculture. At the meeting of the nurserymen in New York in June, Mr. Van Deman spoke favorably of the Crandall as a new variety of Black Currant, of large size, with less of the strong odor peculiar to its class, and consequently better flavored. The most important fact, however, was brought out by Professor L. H. Bailey, of Ithaca, New York, which was that there was no one distinct variety that could properly be named Crandall, as the plants sent him were evidently a lot of mixed seedlings diverse in character, some bearing large and others quite small berries. It was stated that Mr. Crandall had grown a quantity of seedlings from the Missouri Currant, and that parties had obtained and propagated from a lot of these mixed seedlings plants to which they gave the name "Crandall," instead of selecting, as they should

have done, a single plant, and propagating stock from it for a new and fixed variety.

The Crandall, as described and illustrated by those offering it for sale, has very large berries, and is represented as remarkably productive. Its peculiarities seem to be small and scanty foliage, with many small clusters, with three to five or six berries to the stem. Samples sent me, for testing, from the introducer, indicated that Professor Bailey was probably correct as to their mixed character, as their average was scarcely up to that of the Black Naples. There were a few quite large berries, many medium, and more very small. Raw or uncooked they had no attraction for me, and when stewed with fine sugar none of my family cared to eat them. Their introducer claims that they are excellent made into pies; but I should not place them high in the scale for any purpose, as compared with raspberries, blackberries, or even with other currants. It is but fair, however, to say that I am not very partial to Black Currants; and unless the character of the Crandall can be improved and fixed, by growing it from a single selected specimen plant, I certainly should not regard it as worthy of introduction. In its present condition I think Mr. Van Deman was inclined to commend it above its merits.

Delaware, Ohio.

George W. Campbell.

The Utah Black Currant.

To the Editor of GARDEN AND FOREST:

Sir.—You inquire (page 352) whether this is still under cultivation? You will find it in every edition of our catalogue for the past twenty or twenty-five years, and we suppose plants must be growing all over the Union. It is now over its fruiting season; but I enclose a branch from a yellow fruiting plant. The berries are nearly double the size of the ordinary Missouri Currant; but the most careful examination fails to find any specific difference between it and the eastern form of *R. aureum*. Our stock originally came from Mr. Siler, then of Saint George's, southern Utah.

When in Salt Lake City in 1873 our party was received very generously by the Mormon people, and one of them, Mr. Jennings, gave us the freedom of his beautiful garden. The Black Currants were then growing in great quantity, and they were nearly as large as we grow Houghton Seedling Gooseberries here. The flavor was delicious, and I think most of our party gathered them by the handful, and enjoyed them hugely. But I have never found them so piquantly toothsome here, nor are the fruits so large and tempting. They seem to require the dry soil and arid climate of the central regions of our country.

I have seen notices of this Crandall Currant for a year or more past; and desiring to try everything, sought last spring to buy a few hundred somewhere. But after reading the statement that it was a variety of the Missouri, and suspecting its identity with our own Utah Black and Utah Yellow, we felt very thankful that we had failed to spend our money.

If careful comparison shows the form more lately introduced to be identical with the Utah Black it would be advisable to drop the name of "Crandall."

Germantown, Pa.

Thomas Meehan.

Recent Publications.

Annals of Horticulture in North America, for the year 1889. By L. H. Bailey. New York: Rural Publishing Company. 12mo; pp. 249.

This is the first volume of a proposed series of year-books, which are intended to make a current record of horticultural progress. The first half of the book treats of such general subjects as the yields of various crops for the year with their prices, the newer fruits which are adapted to special localities, recent tendencies in ornamental gardening, the diseases of plants, insects injurious to plants, horticultural work in the Department of Agriculture and in the Experiment Stations, with notes on the transactions of the more important horticultural associations in the country. Many of the articles in this part of the book have been prepared by specialists and some of them have been taken from the leading horticultural journals of the world.

The last half of the book is devoted to special annals, the most important of which will be considered the list of plants introduced in 1889, a catalogue of kitchen garden vegetables which were offered for sale in North America in 1889, and the plant portraits which have appeared during the same year. It will hardly be questioned that a carefully prepared year-book of this sort will have great value for reference and it will become of greater value as the years pass on. This particular

volume, as Professor Bailey explains, has been somewhat hastily prepared and naturally he has not had the co-operation of the horticulturists of the country to such an extent as he should be able to count upon hereafter when the enterprise has become an established success. One is hardly disposed, therefore, to search for any shortcomings in the book, but rather to welcome it as the beginning of a series which will prove of substantial value to American horticulture. We are glad to note the promise that the scope of the succeeding volumes will be broader so as to include more of European horticulture.

Perhaps the chapters of most value are those which deal directly with plants of the year. The list of kitchen garden vegetables seems very complete and it will furnish invaluable material for studying plants in the future. It ought also to serve a good purpose in preventing the duplication of names. In looking over the catalogue of plant portraits for 1889 we observe that some half dozen of the portraits which have appeared in this journal during the year have been omitted. Some of these are important, as, for example, the portraits of *Croton Alabamensis*, *Philadelphus Lemoinei* and *Yucca elata*. We observe also that none of the illustrations in the *American Agriculturist* have received any credit; but no doubt such errors will be less frequent in the succeeding numbers.

Notes.

Eighty million feet of timber were contained this year in the annual "drive" of logs sent down the Connecticut River, most of it being consigned to Holyoke, Massachusetts.

A large part of the cranberry picking on Cape Cod is now done by Portuguese, both men and women being employed. There are now more than a thousand of these immigrants in Provincetown, forming about one-fourth of its population.

Hollyhocks, single and double, formed the chief feature of the Massachusetts Horticultural Society's show in Boston on July 19th. Mr. Joseph S. Fay, of Wood's Holl, sent the largest contribution, while those of Mr. C. F. Curtis, of Jamaica Plain, Messrs. Edwin Sheppard & Son, of Lowell, and Dr. C. G. Weld, of Brookline, were also remarked.

The Japanese Box Elder (*Negundo cissifolium*), which has been flowering and fruiting in this country for several years, seems to be a most desirable tree for the borders of a small lawn. It is a round-headed tree, with clean, thick foliage, and it is strikingly beautiful in midsummer on account of the delicate color of its young shoots, which continue to grow after most other trees have finished their growth for the year.

One objection to *Nymphaea tuberosa*, of which Mr. Horsford speaks in another column, is that by the production of tubers it multiplies so rapidly that it will soon fill a large pond, and may crowd out plants of less aggressive vitality. Mr. Gerard finds that *N. Marliacea* is also prolific of tubers, so that it will soon be within reach of every one, and it, too, may prove a dangerous competitor in the struggle with other aquatics.

In his article on Botticelli, published in the *Century Magazine* for August, Mr. W. J. Stillman says with reference to the artist's picture of "Spring," where the foreground turf is thickly dotted with the common flowers of Tuscan meadows: "The non-occurrence of the Anemone, now one of the most splendid attractions of the flora of Tuscany, in this collection of flowers, which is painted with almost scientific exactitude, is considered as a proof of the late arrival of that flower from the East, and that it did not exist there in the time when this picture was painted. It is certain that if it had been known in the fields of Florence its conspicuousness of form and color would have made it impossible to leave it out of this gorgeous *hortus siccus*."

The house once occupied by Governor Endicott, which was recently torn down in Salem, Massachusetts, was one of the oldest in the commonwealth. It is said to have been first framed in England, then brought across the ocean and set up in Gloucester. In 1628 it was purchased by Endicott and taken apart, removed to Salem and rebuilt on what is now the corner of Washington and Church Streets. After the Governor's death in 1665 it was still for some time occupied by his family, and for a while the sessions of the General Court were held within it. Afterward it was moved a short distance away, and went through many vicissitudes, its last service having been as a storage-house. Its timbers were found to be of English Oak of great size and still in apparently perfect condition.

Bulletin No. 10 of the Minnesota Experiment Station speaks as follows with regard to the bagging of Grapes: "The varieties treated were Delaware, Early Victor and Brighton. The fruit was bagged with paper bags when about the size of small peas. At the harvest, the bagged grapes were better in every case than those not bagged, but the most marked difference was with the Brighton, the bunches of which were clean, perfectly colored, and the sweetest grape I have ever eaten. Those exposed were not so good in any way, being very dusty and uneven in ripening. In our previous trials with Concord and Worden and some other varieties, the result has been uniformly in favor of the use of bags as a covering." The cost of bagging was estimated as varying from a quarter of a cent to one cent a pound.

In answer to a question, Mr. F. W. Burbidge writes in *The Garden*: "The first *Cattleya* ever introduced into Britain was *C. labiata*, found by Mr. William Swainson in the Organ Mountains, Brazil, and brought to England in 1818. On this plant Lindley founded his genus *Cattleya* in honor of the late Mr. W. Cattley, of Barnet, one of the first amateurs in England to form a collection of Orchids. Mr. Cattley died in 1832 and his plants went to the collection of Mr. Knight (now Veitch's) at Chelsea. If this true old *C. labiata* exists wild now in Brazil, its locality is unknown, and it has not been imported for forty years or more. Sander has had men hunting for it for years, but it is now believed to be extinct. In cultivation it is rare and valuable, and is known as the old autumn-blooming *C. labiata* or *C. labiata vera*. Botanically, however, all the *Cattleyas* are now considered as geographical forms or varieties of the old *C. labiata*. It has a robust constitution, as is proved by its having lived on so long in our collections, since the last importation came nearly half a century ago."

In an article recently published in *Nature* it was stated that "as far as known at present the Roses of western Asia have no Sanscrit name and were not known in ancient India. Yet *Rosa Damascena* is grown on a large scale for the manufacture of Rose-water and essence of Roses throughout northern India as far as Ghazipur, in twenty-five degrees north latitude. It is not impossible that the western Roses were introduced into India by the Mohammedans. As there is no Sanscrit word, so is there no original term for the Rose in Hindoo. In most Indian languages the cultivated Rose is called *gūl*, which is the Persian name. It is called *gūlāb*, which really means Rose-water, unless, indeed, as sometimes stated by Munshis in India, *āb* in this case is a suffix with no separate meaning. In addition to their local names, some of the wild Roses of Himalayas are often called *gūlāb*, *bān gūlāb* (the Rose of the Forest or Wild Rose). These facts seem to us of interest, as illustrating that wide-spread influence of the Persians which has been dwelt upon in the articles on the History of the Art of Gardening which have recently been published in GARDEN AND FOREST.

The New York *Sun* recently contained a long description of the Vanderbilt estate near Asheville, North Carolina. Not only the magnitude of the enterprise but the intelligence with which it has been undertaken puts it at the head of all contemporary enterprises of the kind in this country. Five thousand acres with a frontage of four miles on the French Broad River were purchased by Mr. George Vanderbilt in a region famed for beautiful scenery and a delightful climate. Messrs. F. L. Olmsted & Co. were employed to aid in choosing and preparing a site for the house, instead of being called in—as is so often the case with landscape-gardeners—after the architect had done his work. The house, which Mr. R. M. Hunt will build, is to be of Indiana limestone, and, with its connected offices, nearly 500 feet in length. It has been designed in an Italian Renaissance style, and one façade will be supported by a retaining-wall rising thirty feet from the face of a hill-side, commanding a superb distant mountain view. Clay is abundant in the vicinity, and a brick-making plant has been set up, as two or three million bricks will be needed for the house and its dependencies, in addition to tiles for the underdraining of the land. Other materials will be brought to the spot by a branch railroad two and a half miles long, constructed for the purpose, from the nearest station. The intervale lands on the river are to be farmed, while of the hill lands fully four thousand acres are to be improved as a forest under the advice of the landscape architects. It bids fair to become, in a few years, one of the most interesting places in America for the lover of rural life on a lordly scale to visit, and one which will represent not merely a large outlay of money, but the intelligent co-operation of great wealth with the best science and the highest art that the time affords.

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National Parks.

LAST week we spoke of the necessity of some immediate action to save a remarkable grove of Giant Sequoias in Tulare County, California, and since the paper was published we have received a petition addressed to Secretary Noble, in which the facts we published are set forth with the prayer that the land may be withheld from entry until Congress has an opportunity to act upon the matter. The petitioners desire that Congress shall set apart this particular group of Big Trees, which are scattered over some four or five square miles, together with certain other outlying groups, as a "national park," to be devoted to public use forever. There is little doubt that the sentiment of the country would favor such a consummation. The Mariposa Grove, it is true, has been reserved, but this is comparatively small and isolated. The other forests of these Big Trees are disappearing with frightful rapidity. The Fresno trees are already condemned, and the mills are running now which will soon convert them into lumber. It is lumber, too, which the speculators want who have recently obtained possession of much of the Sequoia lands in Tulare County, and, of course, these trees must go. It is to be remembered, too, as John Muir points out in the current number of the *Century*, that more trees are wasted in these mill operations than those which are actually made use of, because, after the manageable trees have been cut and blasted and sawed, fire is let loose among the refuse to clear the ground, so that the trees which were too large to be converted into profitable lumber are destroyed as well as the saplings and seedlings. As we have often said before, the vast herds of sheep in these mountain pastures create a desolation even greater than that caused by the axe, and here, too, the fires which are kindled to improve the pastures sweep through the forests from end to end, and these groves of mammoth trees will soon be nothing but a memory unless some legal protection is thrown about them. It must be admitted that our experience with so-called "national parks" hitherto has not been encouraging. One has only to read the defense of the management of the Yosemite Park by the Governor of California to be convinced that its scenery has been mutilated and defaced almost beyond the power of restoration.

But if any additional evidence was necessary the illustrations of Mr. Muir's article above referred to will furnish it. Here we see soft expanses of meadow turned into plow-land and the stumps still standing and still sound of some 2,000 thrifty young trees which have been cut away for some unknown purpose. Besides this total destruction of the trees we see beautiful groups of young conifers disfigured into the likeness of German toy-trees by having all their lower branches ruthlessly lopped away. There are rising murmurs of complaint to the same effect regarding the Yellowstone Park, and even the Niagara Reservation, which is in the heart of a civilized country and embraces so small a space that it can all be easily and constantly inspected, is only kept from being hopelessly vulgarized by constant watchfulness on the part of the people.

It is perhaps a misfortune that all lands set apart for public use should be designated by the name of "park," a word which suggests to most people some attempt at gardening or decoration. This proposed reservation will be primarily a forest and it should be so designated. Certainly it should not be called by a name which has come to be adopted as a common title for fair grounds, race tracks, play grounds, city squares, groups of adjacent private residences, and many other things equally incongruous. It is plain that any attempt to dress out a Sequoia forest with ornamental planting or floral finery would be ridiculous. What is needed in such a place is the preservation forever of the essential natural features of the scenery. The motto of the association whose work brought about the law for the Niagara Reservation was "To preserve the Scenery of Niagara." This, in a broad sense, should be the aim in administering the Yosemite, the Yellowstone, and the Tulare Forest. No other justification for taking possession of these places in the name of the people is needed than an honest effort to preserve, as we have inherited them, these treasures of beauty and sublimity, of majesty and mystery, of grandeur and of grace, and to transmit them unimpaired to our posterity.

But while everything like artificial embellishment should be avoided in the preparation and management of these representative pieces of scenery, there is an opposite danger to be shunned. It is too often assumed that because a place is to be treated naturally, it can therefore be successfully administered by men who have no special aptitude or training for such work. It is admitted that study should be given to a work of landscape art in which artificial arrangement and construction prevail, but it is taken for granted, on the other hand, where a simple and natural treatment is desired, that no thought or study is demanded. Therefore it happens that Governors and others who have the appointing of executive officers for the administration of Reservations like the Yosemite feel that they do their whole duty if they only select men of energy and honesty and business ability. But the fact is that the problem of preserving as nearly as possible the original and natural expression of a given piece of scenery is quite as difficult a one as the creation of a landscape picture out of the raw material. It is a general truth that, in every work which makes appeal to the æsthetic sense, simplicity of conception and of treatment is an essential condition of the highest success and is the crowning proof of genius. And in this special case it is plain that only an artist of the first rank is able to decide what are the essential and enduring features in a given passage of scenery and what are merely temporary and adventitious. It will not be enough to let the trees alone in the Tulare Forest. It must be adapted to human convenience. Roads must be prepared and other arrangements made so that it can be seen, and seen by great numbers of visitors at all seasons, and to the best advantage always. And these arrangements must be made not for to-day, but for all time, and during this time the forest will be constantly changing. Trees will grow and trees will die, and it will require the exercise of the keenest foresight to make a preparation which will best meet these

ever shifting conditions so that the forest will be preserved and maintained, and at the same time prepared for use without showing the touch of man. Work must be done, but it must be work which conserves without blemishing, and work which will make all these forest-treasures available without defacing one of them. Such a task requires as much ability as the highest creative or constructive work of the landscape-gardener. No one is equal to it who does not possess the faculty of the true artist and who has not learned to have a reverence as well as a love for Nature.

Botany at the University of Montpellier.

THE readers of GARDEN AND FOREST have already read accounts of the celebration in May of the six hundredth anniversary of the foundation of the University of Montpellier. To botanists this celebration had a special significance, for, since the foundation of the Botanic Garden by Henry IV. in 1593, and the installation of Richer de Belleval as Professor of Botany, the picturesque university town has been the home of a large number of illustrious botanists. In 1889 there was established at the university an *Institut de Botanique*, and, in a very interesting pamphlet, Professor Charles Flahault gives an account of the buildings erected and of the courses of instruction, together with short biographical notices of the prominent persons who have either occupied the chair of botany or pursued their botanical studies at Montpellier. The list is long and includes an astonishing number of illustrious botanists. Amongst them are the names of Rondelet, Clusius, Lobelius, Bauhin, Magnol, Tournefort, A. de Jussieu, Draparnaud, A. P. DeCandolle, Delile, Duval, Bentham, Moquin-Tandon, Charles Martins and others well known in the history of botany. Besides those mentioned are other names known rather in the literary than the scientific world. Rabelais, the pupil and friend of Rondelet, who introduced his master under the name of Rondibilis in "Pantagruel," we are told was not a very zealous pupil, and Rousseau we are informed was more occupied with his health than his studies while at Montpellier in 1737.

The Institut occupies three principal buildings in the Botanic Garden: the Pavillon Richer de Belleval, including the rooms devoted to instruction; the Pavillon Magnol to research in anatomy and physiology; and the Pavillon de Candolle containing the herbarium, library and the office of the Director of the garden. The equipment for general instruction is liberal, but we notice with special pleasure the ample provision made for research and the facilities offered to those who wish to consult the very valuable collections belonging to the University. One room in the Pavillon Magnol is reserved for visiting botanists who wish to pursue botanical investigation. It is to be hoped that the day is not far distant when, in America, it will be generally recognized that the botanical resources of our universities should be so administered that those who wish to pursue research will find abundant opportunity and encouragement. The plan adopted at Montpellier deserves careful study and should commend itself to all American universities as a model to be followed by them as far as their means permit.

Much of the wastefulness in the methods of cutting timber now in use in this country is a matter of habit, a survival from the times when the chief need was to destroy timber as fast as possible in order to clear the ground for cultivation. It is easier to go on in the same way than to change, and much timber is now wasted that would yield a profit to the owner if it were rightly handled. Many lumbermen recognize the need of change in the direction of greater care in cutting and in the handling of timber lands, but they leave the work of beginning the use of new methods to those who are to come after them. It is often asserted that regard for their own interests will lead lumbermen and owners of timber lands to guard against waste whenever such care becomes necessary. But it is

necessary now. It would be good economy, would be profitable in all cases in which reasonable care is lacking. The fact is, as all competent observers of human action are aware, that men in general are very far from being controlled by an intelligent regard for their own interests. Enlightened self-interest is an entirely adequate principle for the guidance of human conduct, but to bring men to accept it, and to act upon it, has always been a matter of great difficulty. It requires much discussion, reiterated precept, and often the sharp lessons of painful experience, to persuade men to do what is most profitable to themselves, to adopt such courses of action as will yield them the greatest benefits.

The need for improvement does not usually become plain to everybody at the same time. It is more apt to be perceived by a few at first, and earnest and long-continued effort on their part is often required to awaken others to a sense of its importance or necessity. Not only are men long indifferent to what they afterward recognize as necessary and fortunate for themselves, but they strenuously resist the effort to bring about changes from which they are to receive the principal advantages. This experience is always being repeated. It is a constant feature of human life and action. It is all exemplified in the matter of methods of forest-management in this country. Greater care in avoiding and preventing waste would be profitable now. The time has already come to practice it. Lumbermen can make more money by it this year and the next than they do by the methods now too commonly used. Such reasonable care would increase the value of their timberlands so that they would sell for more or be more valuable property as an inheritance for their children. No matter how abundant our timber supply may be, or how long it is likely to last, it would be wise and profitable to avoid wasteful methods of cutting timber and of handling timberlands. It is only sensible and practical economy to employ all available means and conditions to increase the productiveness of wooded lands, and to make the local timber supply everywhere last as long as possible.

Native Shrubs of California.—IV.

Lavatera assurgentiflora, Kellogg (Proc. Calif. Acad., i, 14). The number of things I shall have to say about this *Lavatera* will be out of proportion to its merits as an ornamental shrub; for these are not great. A stout and heavy-looking bush or small tree, with a not unsightly, angular, Maple-like foliage, and a profusion of rich red flowers hung on long and slender stalklets from the axils of the leaves, it is sufficiently showy to have been cultivated everywhere throughout the maritime parts of California, apparently from the early days of the Spanish settlements.

Unquestionably indigenous to Californian territory, it is never seen growing wild except around old dwellings or near gardens; and, since along with the Acacias, Eucalyptus and other Australian trees and shrubs, it comes into flower soon after the winter solstice, a stranger would take it for an exotic from the southern hemisphere. Such was the impression it gave me when I first saw it, blooming beautifully in midwinter, many years ago. It is one of a considerable number of trees and shrubs which are found wild nowhere else, in the world except upon two or three rocky islets which, although politically a part of California, are barely visible above the horizon as one looks out to the seaward, on a clear day, from Santa Barbara or San Pedro.

When Dr. Kellogg named and published the species as new to science, he put upon record a tradition that the seeds of it had been brought in the first place from the island of Anacapa. It does not appear that any botanist or amateur had authenticated this supposed habitat; nor has such authentication ever yet been made. On the contrary, several intelligent men who, although not botanists, know the *Lavatera* very well, and who have been on Anacapa repeatedly, declare that it does not grow there. I nevertheless suspect that if ever a zealous and careful botanist shall visit Anacapa he may find it lurking among the half-cavernous niches of the basaltic columns not far above the water's edge. It should be sought in some such place, and not on the dry and exposed summit or sides of the island, where other shrubs grow,

The exact type common in cultivation all up and down western California has, within a few years, been found on one or two maritime rocks smaller than Anacapa and lying near the large island of Santa Catalina. But the principal native locality for the species is the island of San Miguel, the northernmost member of the Santa Barbara group, and an island two or three miles in extent. But the shrub of San Miguel differs in several ways, and quite notably, from that which is in cultivation, and which came from the more southerly station. It is of more robust and compact growth, making a shapely and handsome small tree; its leaves are much larger, its flowers of a deeper red, and the stellate pubescence, prevalent in the malvaceous family, is far more abundant.

On my return from San Miguel Island in 1886, I felt some suspicions that the *Lavatera* might be proven indigenous to the peninsula of San Francisco. Although 300 miles of sea intervene, the soil and climate of the two localities are much alike. I had seen it flourishing in abundance at the Cliff House in wild looking places among the bluffs overhanging the sea, and also, as I thought, in places among the sand hills rather remote from where it was likely to have been planted. I had also been informed by older members of the California Academy that it had been still more common years ago than now at various places back of San Francisco, where there were no settlements. But having revisited and carefully inspected every locality there, I became convinced that it is not indigenous on any part of the peninsula of San Francisco. The largest trees, and those appearing as if they might be twenty years old or more, are either under cultivation and where they were planted by the hand of man, or else in the vicinity of old dwellings. It is very commonly planted in rows along the western and northern sides of market-gardens, where it speedily grows into an effective hedge, which, while not dense enough to be impervious to animals, serves a useful purpose in breaking the force of the cold sea winds which prevail from those points of the compass during the summer.

The leaves and twigs, abounding in mucilage, are a nutritious and wholesome food for sheep and cattle, which are very fond of them. On San Miguel the only trees surviving in 1886 were certain large-sized ones, which bore their branches above the reach of any ruminant. The smaller ones were dead or moribund through having been too closely browsed by the sheep.

The individual flower of this species is really very beautiful; and it is only because the branches are a little coarse and unwieldy, and the foliage apt to conceal the richest profusion of the flowers, that the shrub as a whole is not highly attractive. The petals, an inch long or more, arranged as in the Hollyhock or Mallow, are of a peculiar deep pink color, veined with almost a carmine. On first unfolding they spread apart only so far as to form a bell-shaped corolla, afterward becoming abruptly deflexed from a little above the base, so that the body of the corolla is inside out; and since the flowers are pendulous, each on a long, slender stalklet, this inversion of the corolla gives the fullest exposure of the stamens and pistils to the favoring agency of the winds. The seeds, which are under all circumstances matured in abundance, germinate freely where they fall; and so the species spreads wherever planted, if not too far from the sea. In the interior of the state I have never seen it.

Although none of the other three North American species of this genus are properly Californian, inasmuch as they inhabit each an island of its own off the coast of the Mexican territory of Lower California, still they must be mentioned in connection with *L. assurgentiflora*, and I name first of the three *L. venosa*, confined to the little island of San Benito, the position of which is about 500 miles south of the islets occupied by the best known species. And while an intermediate islet has yielded a third, and a very different species, the two which belong to those widely separated extremes of our *Lavatera* archipelago, although so distinct that no botanist having seen them both will be likely to think of them as very closely related, they are far more like each other than either one is like either of the two whose geographical range is intermediate. This is another strange fact to be noted in connection with this capricious sorosis of sea-rock shrubs.

L. venosa has about the same foliage as that of *L. assurgentiflora*, though of a deeper green, with even less pubescence. Its flowers are also hung each upon a long and slender peduncle, but they are rather more than twice as large, commonly measuring three inches from tip to tip of the widely spreading petals. The color of the petals is mainly white below the middle, of a rich violet above, about five heavy veins of the violet streaking the otherwise white portion of the organ down to its base. The leaves being rather smaller than

those of *L. assurgentiflora*, and the flowers twice as large, it is far more showy; and the individual flowers are greatly admired by the few who have seen them. Two years ago some small seedlings were brought to me from San Benito by a friendly naval officer whom I had asked to do me the favor, and the one surviving individual of the lot, now blooming luxuriantly at Berkeley, is doubtless the only one alive upon this or any other continent. Its mode of growth is altogether peculiar. There is always an erect main stem, from which the branches take a descending instead of an ascending or even horizontal direction, so that the trunk is ultimately concealed by the leafy and flowery branches whose tips reach the ground and then turn up or spread or straggle about. My bush having been continuously in flower since the beginning of February, promises now a crop of seeds. It seemed to endure the slight frosts of our "Bay region" about as well as does its familiar ally, whose native station is far more northerly than its own.

L. insularis, of the Coronado Island, seven miles off the coast of northern Lower California, and *L. occidentalis*, of Guadalupe Island, are more robust shrubs than either of the aforementioned, and their stout branches, short and firmly ascending, combine to form a low, umbrella-like head; their large greenish and violet-streaked corollas are strictly bell-shaped, inserted on short peduncles, and are mostly concealed by the foliage. The essential distinction between these two, as species, lies in the foliage, and is one which an amateur might overlook, although the eye of a practical botanist would quickly both catch the marked difference and recognize its specific importance. In *L. insularis* the five or seven lobes of the leaf radiate all around the end of the leaf-stalk, giving quite a star-shaped outline to the whole. In *L. occidentalis* the lobes all incline forward in such wise that the leaf is rendered digitate or hand-shaped. These two species, each restricted to its own island, and the two islands more than 200 miles apart, form a group by themselves, both having gray-green foliage, short-stalked violet and green flowers, with corollas broad and open even to the base, but not recurved or reflexed; both also have that compact habit which, making display of the handsome pointed foliage, compensates for the concealment of the flowers.

It is a curious fact that, while *L. venosa*, the home of which is nearest the tropic, endures well the winter of the latitude of San Francisco, *L. insularis*, whose locality is only thirty miles below San Diego, is more tender. Of two specimens of the latter which I brought to flowering here from seeds gathered while on Coronado in 1885, one was killed by frost two years ago, and the other succumbed a year later.

But the main charm of these shrubs is that which they possess in the eye of the student of plant geography. The genus *Lavatera* belongs to the Mediterranean region of the Old World, where there are perhaps twenty species. There is one in Australia. On the continent of America not one occurs. On a few Pacific coast islands and islets lying at distances of from seven to twenty-five miles from the mainland, we have three, with a fourth on another which lies at a greater distance.

That all these species, even when transferred to the latitude of San Francisco, begin their new growth and exhibit their flower buds about Christmas, comes of the fact that the climate they are all used to is in effect a tropical one. On their respective insular shores they all grow at a little distance from the water line, where the temperature is as mild and equable as possible and where there is never the slightest frost; and there is no island on all the coast whose vegetation does not seem to be about three weeks earlier than that on the adjacent mainland.

The three southerly species here spoken of, as yet almost unknown except to two or three Californian botanists, will be slow in getting into cultivation. The open air climate of San Francisco, even, is rather too severe for them; but on account of their great botanical interest as well as for their singular beauty they are sure to receive further attention.

University of California.

Edward L. Greene.

Foreign Correspondence.

London Letter.

LILiums were the principal feature at the last meeting of the Royal Horticultural Society. Mr. H. J. Elwes delivered an address of exceptional interest, both botanically and horticulturally. As monographer of the genus, and as a cultivator of the plants for many years, Mr. Elwes has special claims to be heard on the subject of their botanical differences and their requirements under cultivation. Whilst few will be found to decry Liliums as ornamental plants, there are

many who find their cultivation difficult. A large proportion of the species are unsatisfactory as a rule, the few cases of their good behavior in the garden being quite exceptional. It may be said with regard to not a few of the species, that we are as yet ignorant of the conditions essential to their permanent welfare in the garden. This is proved in many ways. For instance, we find those who are lucky enough to succeed with the majority of *Liliums*, declaring that certain given soils and conditions are bound to prove suitable for those plants which others fail to grow. But when these named soils and conditions are carefully provided, even then it often happens that success does not result. Many good gardeners fail with such species as *L. auratum*, *L. Brownii* (*Japonicum*), and even *L. speciosum*. At Kew, where many rare species are a success, *L. candidum*, the glory of thousands of cottagers' gardens in England, is a failure; *L. longiflorum*, too, is far from satisfactory in the open air. On the other hand, *L. auratum* is a giant both in stems and flowers, giving no trouble whatever. Such rare and usually "miffy" species as *L. tenuifolium*, *L. Parryi*, *L. Krameri* and *L. Leichtlini* are equally satisfactory. The commoner species are abundantly represented, and, as a rule, thrive most satisfactorily. This success has not been attained at once, but only after repeated experiments in different parts of the garden and in different soils. The best results are the outcome of planting the bulbs amongst the loose-growing shrubs in deep beds of good soil. Fungoid diseases have given some trouble lately, and it has been suggested that leaf-soil is often the cause. One great bulb-grower in England has convinced himself that leaf-mould, as prepared and used in England, is the curse of the bulb-garden, and has given up its use entirely.

Mr. Elwes, in his monograph published in 1880, recognized fifty-two species of *Lilium*, almost every one of which has been in cultivation at one time or another. In his address last week he dwelt specially upon the fact that notwithstanding their long cultivation in gardens, and their readiness to produce seeds, yet the number of hybrid *Liliums* raised is very small. Many have tried to procure hybrids, and some have publicly declared their success, but the only well marked hybrids hitherto raised are *L. Parkmanni*, the result of crossing *L. auratum* and *L. speciosum*, and which was obtained in Massachusetts some twenty years ago. A second hybrid is the offspring of *L. Dalmaticum* and *L. Hansonii*, raised here by Mr. Powell. To these must now be added one called Francis Fell, and exhibited last week by Mr. Ware, of Tottenham. It is the result of crossing *L. Parryi* with *L. pardalinum*. Unless for the purpose of giving vigor and a stronger constitution to some of the weaker kinds, there does not appear much need for hybrid *Liliums*, the genus presenting an exceptionally wide range of variation in size, form and coloration of flower as well as in habit and season of flowering.

Collections of the flowers of *Liliums* were exhibited by some of the most noted growers. In addition to the new hybrid already mentioned, Mr. Ware sent flowers of *L. Bolanderi*, a new kind allied to *L. maritimum*, with glaucous leaves in whorls, and small flowers, the segments narrow, reflexed and colored purplish crimson, with blotches of a darker shade. It is a distinct and pretty little plant.

Zinziber D'Arceyi was exhibited as a new plant from the South Sea Islands by the Messrs. Veitch. It has leaves variegated with white and creamy yellow, and promises to be a useful little foliage plant for the stove.

Masdevallia Schraderiana is an attractive little species with fleshy erect leaves and an erect flower-scape. The flowers are an inch across, with three long tails; the upper portion of the segments is purplish in color, the lower part white, edged with purple, the tails being dull yellow. Baron Schröder obtained a first-class certificate for it.

Cypripedium Youngianum is the produce of *C. superbien*s and *C. Ræbeleni* and is a superior hybrid. Its petals are five inches long and narrow, white with greenish lines and thickly spotted with purple-crimson, the margins fringed; the sepals are of the same color, but flushed with crimson instead of being spotted; the lip is hairy and colored pale brown. It was exhibited by Messrs. F. Sander & Co., and was deservedly awarded a certificate.

Zygopetalum crinito-maxillare is a remarkable hybrid, its parentage denoted by the specific name, and possessed of characters which combine those of its parents. The flowers are about the same size as those of *T. maxillare*, the sepals and petals deep green spotted with brown, the lip deep violet-blue. It was sent from the gardens of Lord Rothschild and obtained a certificate.

Aërides J'Ansoni is the name given by Mr. Rolfe to a plant

lately introduced from Burmah and flowered by Messrs. Hugh Low & Co., of Clapton. It belongs to the group represented by *A. odoratum*, and is in fact merely a variety of that species, viewed in a broad sense. For garden purposes it is, however, sufficiently distinct to merit a name. Mr. Rolfe thinks it may be a natural hybrid between *A. odoratum* and *A. expansum*. It is looser in habit and narrower in leaf than an ordinary *A. odoratum*. The flower segments are tipped and spotted with bright rosy purple, and the spreading lateral lobes of the lip are transversely barred with the same color. The plant flowers freely in a small state and the flowers are decidedly pretty in form and color.

NEW LATE-FLOWERING HARDY AZALEAS.—Mr. A. Waterer, of the Knap Hill Nurseries, has succeeded in raising a new race of hardy Azaleas, which promises to be particularly valuable on account of the lateness of its flowering season. In England the flowers of hardy Azaleas generally are over early in June, the latest to flower being *A. occidentalis*, which is sometimes gay with bloom well on into July. By using this as a breeder and crossing it with some of the larger flowered, brighter colored kinds, Mr. Waterer has obtained a number of very handsome seedlings which bloom in July. I have lately mentioned the glorious effect produced in a few gardens here by the flowers of the hardy Azaleas in June. Mr. Waterer has given these plants an additional value by raising a number of late-flowering varieties which will continue the flowering season some weeks beyond the time the older kinds have hitherto lasted.

London.

W. Watson.

New or Little Known Plants.

Clematis Fremontii.

THIS handsome herbaceous *Clematis* is the western representative of the rare *Clematis ochroleuca* of the eastern states. It has simple or occasionally branching, pubescent stems a foot or a foot and a half high, with large, crowded, leathery leaves, which are sessile, broadly ovate, entire or few toothed, sparingly villous on the lower surface, with very conspicuously reticulated veinlets. The flower is terminal and nodding, with thick purple, narrowly lanceolate sepals an inch long, with tomentose margins and recurved tips. The pedicel becomes erect in fruit which is composed of silky akenes with short tails naked above and silky at the base. The fruit is handsome, although less showy than that of its eastern congener.

*Clematis Fremontii** was discovered by Frémont on his second expedition, his specimens having, however, no note of locality. The plant was not seen again until 1874, when it was re-discovered by Dr. Louis Watson, near the town of Ellis, in western Kansas. It is now known to grow from Missouri and Kansas to the mountains of Colorado. *Clematis Fremontii* is very hardy; it is easily raised from seed and may be increased by division. It thrives in ordinary garden soil and flowers during the first days of June.

Our illustration is made from a plant grown in the Arnold Arboretum, where it was sent several years ago from Colorado by Mr. T. S. Brandegee.

New Orchids.

DENDROBIUM ATROVIOLOACEUM, Rolfe, is a distinct and beautiful species allied to *D. macrophyllum*, better known in gardens as *D. Veitchianum*, though far superior as a garden plant. The sepals and petals are cream yellow, with numerous purple spots, and the labellum heavily marked with dark violet. It was imported from New Guinea by Messrs. James Veitch & Sons, and was awarded a botanical certificate on April 8th.—*Gardeners' Chronicle*, April 12th, p. 463; and April 26th, p. 512.

CYPRIPEDIUM X APOLLO, Measures. A hybrid raised in the collection of Mr. R. I. Measures, of Camberwell, from *C. Stonei* and *C. X vexillarium*, the latter being the pollen parent. It was exhibited on April 22d at a meeting of the Royal Horticultural Society.—*Gardeners' Chronicle*, April 26th, p. 526.

CALANTHE RUBENS, Ridley, is described as a charming novelty, allied to *C. vestita*, but with rose colored flowers. It was discovered by Mr. Curtis in the Langkawi Islands on the west coast of the Malayan Peninsula. Plants are said to have been sent to England.—*Gardeners' Chronicle*, May 10th, p. 576.

DENDROBIUM X VENUS, Rolfe, is a very beautiful hybrid

*Watson, *Proc. Am. Acad.* x, 339.—Watson & Coulter, "Gray's Man. Bot. N. S.," ed. 6, 36.

Fig. 49.—*Clematis Fremontii*.—See page 380.

raised in the collection of Mr. Norman C. Cookson from *D. Falconeri*, fertilized with the pollen of *D. Nobile*. It approaches *D. Falconeri* in character, though the yellow disc of that species is absent.—*Gardeners' Chronicle*, May 17th, p. 608.

BULBOPHYLLUM LEMNISCATOIDES, Rolfe, is a remarkable species allied to *B. lemniscatum* (*Botanical Magazine*, t. 5961), and like it having three remarkable appendages, one from the back of each sepal. It was introduced by M. van Lansberge, from Java.—*Gardeners' Chronicle*, May 31st, p. 672.

Kew.

R. A. Rolfe.

Moorea irrorata.—A few weeks ago, Mr. Moore, Curator of the Botanical Gardens at Glasnevin, Dublin, forwarded to Kew an inflorescence and leaves of an Orchid which he had purchased for a *Maxillaria* at an auction sale, but which differed so much from all Orchids known to him that he suspected it to be something quite new. This view was confirmed by Mr. Rolfe, who has described the plant under the above name. The leaves and pseudo-bulbs resemble those of *Houlletia* or *Xylobium*, the former being two feet long by four inches broad, and the latter four and a half inches long and tapering.

The spike springs from the base of the matured pseudo-bulb, and is nearly two feet long, erect, stout, with about a dozen flowers, each two inches in diameter, upon stalks one and a half inches long. The sepals are spreading, half an inch wide, chocolate colored, almost white at the base; the petals are similar, but narrower. The lip is three-lobed, side lobes rounded and thin, front lobe narrow and pointed. The color is bright yellow, with lines of black-purple; column cream-white. The plant is ornamental, and may be compared to some of the *Houlletias*. The generic name is so far unfortunate in that it resembles *Moræa*, an African genus of Irids.

Kew.

W.

Cultural Department.

Notes on American Plants.

THE Ragged Fringed Orchis, which flowers about this time, is not a very showy plant. The lower portion of the flower, which is known as the lip, is divided into many narrow thread-like segments. The flowers are borne in a loose spike about four inches long by a trifle more than an inch thick, and are of a greenish white color. It grows in moist meadows and pastures, also in thickets and bogs. It needs a moist place, and would thrive along the borders of artificial bogs.

Euphorbia corollata is a favorite plant with many who have grown it. Its height is from two to three feet, bearing its small white flowers in umbels. What appears to be the flower is only the five false lobes of the flower. These are white and very fine, the true flowers being inconspicuous. It is a hardy herbaceous perennial, and seems to thrive in any ordinary soil. Though not a troublesome plant, it soon forms strong clumps, spreading from the root.

A pretty Gentian from the Pacific coast is *Gentiana affinis*, but it varies much. The form now in bloom with us is hardly eight inches high, with blue funnel-shaped flowers over an inch in length and five-lobed. On the lower third of these lobes are numerous lighter spots, which add to the beauty of the flower. It seems to thrive well in this climate, but we cannot speak of its hardiness, because our plants were covered with leaves during last winter. A partly shaded location seems to suit it.

Dionæa muscipula, or Venus' Fly-trap, a native of sandy bogs in the Pine Barrens of North and South Carolina, is already too well known to need description. Its curious, sensitive leaves are its chief attraction, and these alone would well repay the trouble of growing it; but the white flowers, which, when grown in our northern climate, appear about the middle of July, are well worth having. It is not a difficult plant to grow if the right soil and situation are selected for it. Wherever a sandy bog can be made in open sunlight it will thrive. Even if this bog be confined to a common flower-pot the plant will thrive, if its natural home is closely copied. It needs protection from our cold winters, and six inches of leaves makes the best covering.

Rhexia Virginica (Deer Grass or Meadow Beauty) comes into bloom about the middle of July. The plant is seldom more than a foot high, bearing showy rose-purple flowers about an inch wide. The large yellow stamens add much to their beauty. It is a native of sandy swamps in Massachusetts, Pennsylvania, Wisconsin and southward. It needs moist, light soil in the sunlight.

Sedum Oreganum, a Stonecrop from the north-west, is quite an acquisition to a collection of this genus. Its thick, leathery leaves are small but very numerous, and have a purplish tinge, which, in a dense bed, give it a fine appearance. The flowers are yellow and in cymes, much resembling those of *S. ternatum* and *S. Nevii*, formerly mentioned, except in color. Of its hardiness we cannot yet speak, but it seems to like our summer climate and a light, loamy soil in the sun.

Perhaps the most variable of our native Lilies in size and the number of its flowers is the Wild Orange Red Lily (*L. Philadelphicum*). It is not rare to find in flower, in the same field, stalks varying from less than a foot in height, with a single diminutive blossom, to five feet high, with as many as six or eight large flowers. The proportion with more than two flowers to the plant is small, and most stems bear only one and two. But often the very small bulbs will send up a short stalk scarcely a foot high, which flowers. It is a native of dry, sandy soil, and when planted in a clay or clay loam does not seem to thrive at all, or, at least, I never have persuaded it to flower in such soil. But in a light loamy soil it is one of the easiest to grow.

During the summer months, almost everywhere, scattered over the bare summits of the higher mountains of northern New England and New York, may be seen in flower the little

Mountain Sandwort (*Arenaria Grœnlandica*). It is one of our prettiest little alpine, and not a difficult one to grow either by transplanting or from the seed. It is a little, low plant, forming dense tufts of its short, deep green leaves, and from among these, on slender, thread-like stems, scarcely three inches high, are borne the white flowers. These are a third or half of an inch wide. It needs a fine loamy soil, partly shaded, or it may be grown in gravelly soil in a cool place. It will thrive in shaded portions of the rockery. If grown from seed it must be in a fine, light soil, which will not become hard and which has no mixture of clay.

Monarda didyma, commonly called Oswego Tea or Bee Balm, grows much taller in cultivation than in its natural home. In rich garden soil it is frequently four and a half feet high, while two feet is about the height it attains in its wild state. It makes a pretty garden plant, the numerous large scarlet heads being quite conspicuous, and coming out in long succession. It needs full sunlight and ordinary culture.

Cimicifuga racemosa, commonly known as Black Snake-root, grows in rich woods from Maine to Wisconsin and southward. Its stems are from four to eight feet high, bearing at the top two or more long racemes of delicate white flowers. Most of the foliage is below the middle of the stalk. It is easy of culture in either sun or shade, and the long racemes are useful for cutting.

Allium reticulatum, from the western states, is a fine, large species. The stalks are often nearly two feet high, and each bears a large, round, many-flowered umbel of pale purple, or sometimes white, flowers. The flowers are very durable, lasting many days. It thrives in any ordinary soil in the shade, and is perfectly hardy in this climate.

Southwick, Mass.

F. H. Horsford.

Planting Conifers in August.

THERE is still a deeply-rooted prejudice against August planting. The comment is made, even by nurserymen and old planters, that it can be done, but that it is not practicable except on a limited scale and when the removals are for short distances. It is even said that it is misleading the public to advocate the practice. I need not now reiterate the theory of the comparative rest and maturity of the top of an Evergreen-tree after the middle of August, and, in contrast, the activity of the roots in the warm earth during September and October. It is most interesting to examine the roots of a tree late in the fall which had been moved two or three months previously, and to find how amply it is provided with feeders not only sufficient to sustain it against the exhaustion of the winter, but also to give it vigor for a strong start in the following spring. But, theory aside, I am impelled to state a few more facts in my own experience in addition to those heretofore presented (see GARDEN AND FOREST, vol. ii., p. 379), leaving them to have such weight as is due to them.

In the first week of September, 1889, I transplanted a lot of 326 *Picea pungens*, thirty-one Douglas Spruce and six Norway Spruce standing on a lot which I wished to clear and where the soil was considered too heavy for these varieties. The trees would run from two and a half to four feet in height. At the present date I find all the trees in most vigorous growth, with the exception of one *P. pungens*, which is dead. It is not the success in making them live which pleases me, it is the thrift of the trees, which, after an experience of forty years in transplanting, I do not hesitate to say, I never saw equaled in the first year of spring-planted trees. The same can be said of Austrian, Scotch and White Pines, Norway Spruce and *Retinosporas* transplanted last August. They have made better growth than I ever saw in spring planting.

But the objection is at once raised that all these were for short distances, and that "with special care Evergreen-trees may be moved short distances at any season of the year." Without stopping to show the inadequacy of the objection to meet the facts, I will cite other facts which seem to me to prove clearly that long distances may be successfully overcome. On the 15th of May, 1889, I received from a collector in Colorado 500 *Abies concolor* and 100 Junipers. On the 25th of the same month I received 400 *Picea pungens*. These came in such good condition and looked so promising that I ordered from the same collector in August, 1889, a much larger number. Upon this July 24th, 1890, I have personally examined and assisted in counting the two plantings and now submit the results.

Of the spring-planted 500 *A. concolor*, 190 are living; of the 100 Junipers 70 are living; of the 400 *P. pungens* 310 are living. The August collections were delayed in reaching me and were planted from September 9th until the 19th. Of the 2,800 *P. pungens* 2,332 are now living and 468 are dead. Of the 3,223

A. concolor 2,389 are living and 834 are dead. Of the 500 *Pseudotsuga taxifolia* 355 are living and 145 are dead. It may be thought that this is a large mortality, especially so with the Concolors and Douglas Firs. But, as these are all wild seedlings, a considerable shrinkage is to be expected.

Making the comparisons more definite it may be stated in round numbers as follows: Of spring-planted trees: sixty per cent. of *A. concolor* have died; thirty per cent. of Junipers have died; twenty-three per cent. of the *P. pungens* have died. Of fall-planted trees: twenty-five per cent. of *A. concolor*; twenty-nine per cent. of *P. taxifolia*, and twelve and one-half per cent. of *P. pungens* have died. The above seedlings were

ties are mentioned the average temperature necessary for their well-being will also be noted.

Though the members of this family in general are not specially particular in regard to soil, yet there are a few general rules to be observed—for instance, the soil should be coarse and open, to allow the water to pass through freely, and the pots or pans should invariably be well drained by means of a layer of potsherds, cinders or charcoal. A liberal supply of water should be given during the growing season, and after the plants become somewhat pot-bound an occasional watering with liquid manure will have a good effect, providing it be not used too strong. During the winter somewhat less water will



View in the Sihlwald.—See page 386.

of various sizes, from six to ten inches in height. I wish to add, in fairness, that I received from another Colorado collector September 19th, 1889, 1,000 *P. pungens* of a larger size, from one to two feet in height. As might be expected they were more stunted and unpromising. The mortality has been heavy upon this lot, rising above fifty per cent., or, stated more exactly, 527 are dead and 473 alive at this date. For myself I shall continue to advocate the planting of conifers in August and September. For long distances, it is only necessary to guard against heating and drying. Success presupposes care.

Waban Nursery, Newton Highlands, Mass.

Wm. C. Strong.

A Few Strong-growing Adiantums.

THE extensive Maiden-hair family presents much diversity in sizes and forms among its many species, all of which are beautiful, and many of them notably so. It is not intended, however, in this connection to present a catalogue of species, but to invite attention to a few of the stronger growing sorts, many of which flourish under cool-house treatment, or in an ordinary conservatory temperature. Of course all strong-growing Adiantums are not greenhouse sorts, as some of them do much better in a warm-house, but where such varie-

ties are mentioned the average temperature necessary for their well-being will also be noted.

Among the older species, *A. trapeziforme* occupies a prominent place, and is surpassed by few when well grown. It is easy to manage and makes a shapely plant, the leaf-stems being so stiff that they seldom need staking. Its fronds attain a height of from three to four feet, the pinnæ being very large, light green in color and trapezoid in outline. *A. trapeziforme* is of West Indian origin, and has been in cultivation for many years.

A. formosum is another species of special elegance and utility, and is well adapted for cool-house treatment. Its quadripinnate fronds sometimes reach a height of four feet, though they are more often seen two or three feet in height. The pinnæ are much smaller than those of the preceding sort, and the fronds are somewhat stiffer, and are produced from very free-growing rhizomes, the latter being often found coiled around the interior of the pot from top to bottom. It is a native of New Zealand.

A. Peruvianum is an excellent sort of more recent introduction than the above, and, as its name indicates, was first found in Peru. It has long fronds of gracefully arched habit, clothed with very large pinnules of bright, light green, and will make satisfactory progress in a warm house, where its growth in a tem-

perature of sixty to sixty-five degrees will be rapid and strong.

Of course no collection of Ferns is complete without the "Queen of the Maiden-hairs" (*A. Farleyense*), at least no collection that includes warm-house species. This lovely Fern is becoming so widely known that a description seems unnecessary, and for that matter, written description almost invariably fails to do it justice. Suffice it to say that it well deserves the title of Queen, being unrivaled in delicacy, grace and refinement. The origin of *A. Farleyense* has been rather doubtful, though it seems clear that it was first introduced from Barbadoes, and the opinion has been expressed by those qualified to judge, that it really is a cristate form of *A. tenerum*, and it is claimed that seedlings from *A. Farleyense* have reverted to the original type. I have never seen such seedlings; in fact, I can only recollect seeing a fertile frond on *A. Farleyense* on one occasion.

A. Sanctæ Catherinæ is also to be recommended among the strong growers. It is a native of Brazil, and bears some resemblance to *A. trapeziforme*, though rather more compact in growth than the latter, and its young fronds are more noticeable on account of their pleasing bronzy pink tint. When mature its fronds are dark green in color, with shiny black stems, and they average about two feet in height.

A. tenerum is also a desirable species, and seems to be quite widely distributed. It is an evergreen warm-house species, and produces graceful light green fronds from two to four feet in length. The smaller fronds are also valuable for cutting, as they last well in water.

A. cardiochlamæ, otherwise known as *A. polyphyllum*, is one of the finest of all when grown as a large specimen, and like most of the large-growing Adiantums it requires plenty of pot-room to develop its full beauty, and also an abundant supply of water at the root. It was introduced from South America a number of years ago, but does not seem to have become very common. It has upright foot-stalks, but drooping fronds, which are of a pleasing light green color, and usually three times divided. These fronds have been known to reach a height of six feet, though this is unusual, and the average is probably from two to three feet.

A. villosum is another fine species from tropical America, and though considered a warm-house plant, may be readily grown in a temperature of fifty-five degrees. It has dark green, bipinnate, glossy fronds about two feet in height, the stems of which are covered with short brown hairs.

Holmesburg, Pa.

W. H. Taplin.

Rose Notes.

Madame Georges Bruant.—This fine Rose will soon find its way into every good collection. It came through the past two winters in fine style, though many varieties considered absolutely iron-clad have succumbed to the trying extremes of temperature. How it will endure the test of twenty degrees below zero remains to be proved. When its clusters of immense dazzling white flowers open against its profusion of dark foliage it is lovely to behold, and its odor is exquisite. The open rose is very beautiful though only semi-double, for its texture is like satin and its color like driven snow. It seems a pity to note the weak points of a Rose so nearly perfect, but (1) it is liable to mildew when there are very marked changes between the night and day temperature, though not so weak as La France in this respect; and (2) the long, delicately pointed buds are apt to brown on the tips if met by heavy rains followed by a hot sun. It might be called a "Monthly Rose," so regularly does it bloom at intervals during the summer.

Gloire Lyonnaise is one of the very finest of the white Hybrid Perpetuals; not a whit behind the aristocratic Merveille de Lyon or White Baroness, while in most situations it proves a hardier and more satisfactory grower than either. The bloom is a rich creamy white, a tint found in no other Rose of its class. It is a beautiful upright grower, with the soft, leather-like foliage of the strong growing Teas. The open flower is very sumptuous in appearance, very lightly scented, but destined to become our most widely grown white Hybrid Perpetual. In common with all hardy Roses, its beauty is liable to be despoiled just as it comes into leaf by the Rose pest; but one or two good doses of hellebore will prevent this, and we have only ourselves to blame if leafless branches or skeletonized foliage meet the eye.

Madame Plantier is an old favorite, which, though small of flower and fine of foliage, should be found in every garden. There are many uses for which this small, perfect white Rose is especially adapted. It comes safely through all kinds of weather and seldom fails to bring a lavish profusion of lovely flowers.

Polyantha Mignonette must become better known. A row forty feet long planted six years ago was a sight to be remembered as it came into a mass of bloom the last of May. To the uninitiated it was a puzzle; it was guessed to be everything but a Rose, until a very close examination of the foliage settled the question. Rosy pink and white were the great armfuls of fairy roses, the single flowers an inch in diameter and in clusters of forty and fifty. It blooms very perfectly until hot weather sets in, when the roses blight in the bud unless a good part of each cluster is pruned away. We may safely look to this section for some splendid acquisitions for the hardy Rose bed.

The Moss Roses were, many of them, a disappointment, as they all showed a tendency to open in a one-sided fashion and without apparent cause, except our grand old friend *Cristata*, which was in superb condition. The long buds of heavy green moss opened slowly and perfectly to show a splendid double rose of brightest pink, with that peculiar odor which, once inhaled, can never be forgotten.

It seems a great pity that many of the best Mosses, some of the finest Hybrid Perpetuals and the Austrian Roses should be of such difficult propagation as to make it next to impossible to secure them on their own roots. Perhaps the florist of the future will find a means of rooting them more readily, when we may hope to find them more generally distributed through American gardens; for the American amateur insists on having "own-root" plants, and, generally speaking, he is right, for it is a fact that many grafted plants, that should have been in their prime in 1890, were weakened by the freezings and thawings of the winter of 1888-1889, to be killed outright by the severe cold of the past March following a warm February.

Richmond, Ind.

E. G. Hill.

The Brazilian Miltonias.

THE Brazilian species of *Miltonia* are not so generally grown in amateur collections as their beauty warrants. Nevertheless they are very desirable, growing freely and always flowering well under proper care. They have the good quality, too, of flowering at a dull time of year, usually during the months of August, September and October, when their large, conspicuous flowers are very attractive, and they remain in good condition for several weeks. These *Miltonias* can be grown in a shady corner of the Cattleya-house, where it is possible to shade them at all times from the direct sunlight. They should be grown in pots filled to within two inches of the rim with broken potsherds, over which is placed a layer of fresh sphagnum to keep the potting material from the drainage. Equal parts of peat and live sphagnum moss suit them admirably. Care must be taken to elevate them well above the pot and not to bury the rhizome. While growing they require a constant supply of water, and at no time of the year must they be allowed to get dry. Syringing overhead morning and evening is beneficial to them while growing. The following species are those most generally found in cultivation and usually prove the easiest to manage:

M. cuneata, with flowers borne on spikes, several together; the sepals and petals a rather dark shade of brown tipped with pale yellow, the lip white.

M. candida, a very pretty species, bearing many brown, yellow and white flowers on each spike, one of the strongest growers of the genus. Its variety, *Grandiflora*, is a decided improvement, having larger and much brighter flowers.

M. Clowesii, var. *major*, another strong grower producing long spikes freely, with flowers of good size. The sepals and petals are primrose yellow, the ends of which are barred with rich brown; the lip is white, suffused with purple.

M. Morelliana, and its variety *Atrorubens*, decidedly pretty plants, not so tall as those named above, but having larger and more attractive flowers. *M. Morelliana* has sepals and petals of rich, rosy purple, while the very broad lip is pale rose with veins of a deeper hue. The variety *Atrorubens* is much richer in color in all parts, but is rather a rare plant.

M. Regnellii, with flowers on long spikes, sepals and petals milk white, with a rosy colored lip. There is a distinct and superior variety, *Purpurea*, with sepals and petals rosy white, and the lip a splendid purplish crimson.

M. spectabilis, small, but with extra large flowers, having sepals and petals pure white and the broad lip pale rosy white, streaked with violet-purple. This is perhaps the most variable of the Brazilian *Miltonias*, and one of the best.

Many growers grow *M. spectabilis*, and *M. Morelliana*, which is really one of its varieties, on blocks of Tree Fern placed in pots, but they rarely do as well when their small, wiry roots are exposed to atmospheric changes and especially to dry air.

Easton, Pa.

H. Clinkaberry.

Herbaceous Pæonies.

THE flowering season just over has been one of the best I remember for Pæonies. A large bed of named varieties was a fine sight for the two or three weeks during which it was at its best. These plants revel in well manured soil, and, although they are impatient of removal, the manure may be lightly dug in without causing them any injury. If it is wished to move or divide any established plants, it should be borne in mind that they will not flower satisfactorily the first year after removal, but with generous treatment this will be the extent of the loss. Care should be taken in the selection of sorts, only the most robust being suitable for growing in prominent positions. There are some kinds which appear to have a tendency to develop a great number of small crowns that are useless for flowering, and these are very disappointing, for it seems almost impossible to induce them to make really satisfactory growth, and, at most, one or two flowers on a plant are all they will produce. All such kinds are ineffective in a flower-garden. The old *P. officinalis* is very useful for planting in rough places amongst the Grass or as a fringe to the shrubbery, for it does remarkably well when let alone after it gets established. None of the named kinds I have seen can compare with it for this sort of work.

I append a list, selected from about thirty named sorts, which have been exceptionally good here the past season:

Candidissima.—Pure white guard-petals, pale primrose centre.
Carnea grandiflora.—Delicate blush, changing to pure white, incurved flower, very strong and good.

Charles Binder.—Deep rose, very full flower, scented.

Constance Devred.—Deep carmine, large flowers.

Dr. Calot.—Deep rose guard-petals, centre salmon.

Festiva maxima.—Pure white, incurved, stained carmine on centre petals, strong grower, magnificent.

Isabella Karlitzky.—Carmine-rose, full centre, very fine, scented.

Louis van Houtte.—Bright, purple-lake, strong grower, very large flowers, Hawthorn scented.

Marie Dhour.—Pale flesh color, full centre, dwarf, fine and free, scented.

Mme. Muysaert.—Bright rose, light centre.

Mme. Jules Calot.—Bright rose, chamois-yellow centre, scented.

Paul Rubourg.—Rose, very double, late, strong and good.

Rosamond.—Rose, incurved, strong grower, very fine flower, scented.

Rubra triumphans.—Deep crimson, incurved, strong grower.

Whitleyi.—Single, pure white, large ball of golden anthers, dwarf, free, and the earliest of the section.

J. C. Tallack, in *The Garden*.

Disa tripetaloides is a beautiful little species which has lately attracted much attention and even admiration from members of the Orchid-loving community, and it is probable that it will soon become tolerably well known, for it has features which will readily recommend it, viz.: the ease with which it may be grown, the length of time its flowers remain in perfection, and their quiet and charming character—so different from that of the *Grandiflora* section. Flowering specimens have been exhibited during May and June in London. The leaves are lanceolate-acute, deep glossy green, somewhat fleshy in texture, three to four inches long and about half an inch broad in the widest portion. They are clustered at the base, but pass up the scape, which springs from the centre alternately, and change into green bracts. The erect scape is from nine inches to a foot high, and bears as many as twenty to thirty flowers, each of which is about three-quarters of an inch across, and of a beautifully soft, very pale lilac, handsomely speckled with deep rose. The upper sepal reminds one of a monk's cowl with a short, conical spur at the back. The lateral sepals are, in comparison, much larger, elliptic-oblong, while the small falcate petals and linear lip are within the precincts of the upper sepal and require close inspection to make them distinguishable.

This species, although now brought prominently before the public, is by no means new, having, according to Mr. N. E. Brown, of the Kew Herbarium, been discovered over a hundred years ago in South Africa by the traveler Thunberg, and named *Orchis tripetaloides* by the younger Linnæus. Thunberg afterward confused it with his own *D. excelsa*, and Dr. Lindley thought it to be *D. venosa* of Swartz, a plant whose identity has been mixed up with *D. racemosa*. To make matters clear Mr. Brown therefore retained the specific name given by Linnæus the younger, and re-named it *Disa tripetaloides*.

Those who are in the habit of looking at every Orchid as requiring "heat and moisture" will perhaps be agreeably sur-

prised to learn that the subject of this note is a cool-growing and even hardy species. Mr. James O'Brien, of Harrow-on-the-Hill, to whom its re-introduction to cultivation is due, has grown his plants in pans in a cold frame, where they have freely flowered—some of them having even been subjected to frost. It is evident from these facts that *Disa tripetaloides* should grow well in a cool house, without requiring so much attention as some of its larger flowered congeners.

London.

John Weathers.

Kniphofia (Tritoma) Saundersii.—One of the most pleasing and brightest things in the garden lately has been this beautiful Torch Flower. With its deep green, angular, rush-like foliage, and massive stems surmounted by the long spike of brilliant flowers, this is one of the most noble of plants. A well grown clump would be an attraction in the best of gardens. The flowers of this variety are a very pleasing orange-red, shading into orange. They are individually of good size, the spike being a foot or more long. Unfortunately, the plant is not entirely hardy here, needing careful protection from frost and wet, but well worth any amount of trouble.

Chrysanthemum maximum.—A trade circular just received, in which this is included as a choice perennial, leads me to say that it is a weed, or, in other words, a plant not worth a place in the garden. For three years I have been trying it without discovering other merits than its neat, vigorous habit. The flowers, under ordinary cultivation, are little larger than those of a well grown field Daisy, but perhaps if well fertilized they might be half an inch broader. The white Daisies are beautiful in the meadows, but, with their present abundance, it does not seem worth while even to give a slightly better variety room in the garden. Fortunately, *C. maximum* does not seem as hardy as the common White Weed. Some few years ago some seed from Vilmorin produced flowers with a tendency to doubling, and I notice a similar variety offered as *C. semi-duplex*. It is perhaps unnecessary to say that such flowers are abominations. If White Daisies of good size are desired early in the year, it would seem that the single Hybrid Pyrethrums are altogether the most useful and handsomest, both in flower and foliage. In a good strain of mixed seed some fine white ones will usually be found as well as the ordinary reds.

Elizabeth, N. J.

G.

Plant Notes.

Papaver Californicum.

THIS true Poppy, the only one indigenous to California, was discovered in 1886 in the Santa Inez Mountains by Mr. John Spence, of Santa Barbara. It was described by Dr. Asa Gray in the *Proceedings of the American Academy of Arts and Sciences*, vol. xxii., pp. 313-314, thus being one of the last California flowers to receive a name at the hands of that illustrious botanist. Not only is it one of the latest discoveries, but it justly ranks among the handsomest of the annuals of the Pacific coast.

It is rarely found except on ground which has been burnt over, Mr. Spence first finding it far away from any cultivated fields at an elevation of 1,500 to 2,000 feet, on ground which had been covered principally with Manzanita bushes, but had been burned over the year before. Probably for this reason, and from its close resemblance in appearance to *Meconopsis heterophylla*, a less showy plant, but with flowers almost identical in size and coloring, it owes its escape from previous discovery.

As Dr. Gray suspected, this is not a local species, but is apparently widely distributed in southern California, having recently been collected by several botanists in widely separated localities, but everywhere under similar conditions as first found—on tracts of burnt brush-lands at from one to two thousand feet elevation. This spring I observed it in great abundance back of San Diego, near Potrero, and also between the Cajon and Santa Maria valleys, on hill-sides burned over by forest or brush fires last fall. Although I have traversed both sections repeatedly during the past ten years this richly colored flower had never been seen before these fires had denuded the land.

It forms a fine, bushy plant about a foot in height and bears a profusion of large, showy flowers of an average of two inches in diameter. The color of the large, delicate petals is a bright, saturn red to orange chrome, with a centre of a delicate sulphur yellow. In cultivation it is said to make a fine pot-plant, and if it improves as most of our wild flowers do under the attention of horticulturists, it will prove a most desirable addition to American gardens.

Associated with it is usually found *Phacelia Orcuttiana*, another so-called "fire weed" which is likely to prove a welcome acquisition to the garden on account of its masses of white flowers with conspicuous yellow centres. This *Phacelia* grows into a tall, stately plant, branching freely from the base.

It is an interesting problem why the seeds of these handsome plants should lie dormant so many years in the soil, awaiting the—to them—life-saving, destructive fire. After once starting into existence the seed does not seem to require to pass through the ordeal of fire before growing, for the second year after a fire they appear in greater abundance than the first. Gradually, however, as other plants get re-established on the ground these become fewer and fewer, until other vegetation overcomes them, and their seeds again lie dormant in the soil awaiting another deluge of flame.

San Diego, Cal.

C. R. Orcutt.

CLEMATIS MONTANA.—A charming picture of a porch covered with this climber, in a recent issue of *The Garden*, of London, reminds us that the plant, although very rarely seen in gardens in this country, is perfectly hardy here, and that it is one of the very best of the early-blooming vines. Splendid shoots wreathed with the clusters of large white flowers were shown a month ago at one of the weekly exhibitions of the Massachusetts Horticultural Society by Mr. Joseph Clark, gardener of Henry L. Higginson, of Manchester, Massachusetts. *Clematis montana* is a native of Nepal, whence it was introduced into English gardens as long ago as 1831. It is a rampant grower, producing, if the plant is severely pruned immediately after it has done flowering, shoots sometimes six or eight feet long, which flower the following year from end to end. As the writer in *The Garden* says, "its early blooming character, fitness for all ordinary soils, and complete hardiness, save in very cold spots, have raised it to the position it holds in the garden. It must be a poor place that has not rambling over a veranda, trellis, arch or wall *Clematis montana*." The specimen forming the subject of *The Garden* illustration has been planted for over thirty years in its present position, blooming freely every year, and covering the whole front of a house. It is planted in a border close to the wall and obtains little surface water. It is cut back once or twice a year.

The Forest.

The Sihlwald.—II.

IN the organization of a normally stocked forest the object of first importance is the cutting each year of an amount of timber equal to the total annual increase over the whole area, and no more. If is further desirable in any long settled community that the forests be so managed as to yield a measurably constant return in material. Otherwise difficulties in the supply of labor and the disposal of the produce make themselves felt, and the value of the forest to its owner tends to decrease. This is especially true in the case of the Sihlwald, whose mills derive their raw material exclusively from the forest to which they belong, and whose supply of labor is limited to the men whom it furnishes with steady employment. Either excess or deficit in the annual production implies loss.

In order to attain this steadiness of yield it is obviously necessary that a certain number of trees become fit to cut each year. The Sihlwald has accordingly been so "organized" that areas of equal productive capacity are covered by stocks of every age, from last year's seedling to the mature tree. These age-gradations succeed each other in a series so regular that in an hour's walk one may pass from the lot just cut over through a forest of steadily increasing age to the trees which have reached the limit of the rotation of ninety years. Three such units of organization are present in the Sihlwald, but since the character of the Fraumunsterforst, as the forest on the right bank of the Sihl is called, separates it distinctly from the much greater area of the Sihlwald proper, and since the two divisions of this last differ only in unessential matters over which the treatment has no control, it will be necessary to speak of only one of them. The working plan for the Lower Sihlwald, then, prescribes for the forest which it controls the operations of what Dr. Schlich has called in his *Manual of Forestry* "The Shelter-wood Compartment System." It may not be without interest to follow the life history of a compartment in which this system is carried out.

After the mature trees had been felled and removed from the area which furnished the yield of the Lower Sihlwald last year the thick crop of seedlings which had grown up under their shelter was finally exposed to the full influence of the light and air. The felling and rough shaping of the timber,

the piling of logs and cord-wood and the trampling of the men had combined with the crisis of exposure to destroy the new crop in places and create a few small blanks. Here, as soon as the disappearance of the snow had made it possible, groups of the kinds of seedlings necessary to preserve the mixture or destined to increase the proportion of the more valuable species were planted. The operation, necessarily an expensive one, is justified by the greater resistance of a mixed forest to nearly all the calamities which may befall standing timber. Simultaneously with the planting the Willows, Hazels and other worthless species were destroyed, as well as the "pre-existing seedlings," whose larger growth, according to the disputed theory held at the Sihlwald, would damage their younger neighbors more by their shade than their greater volume would increase the final yield of timber. The incipient forest, then, practically uniform in age and size and broken by no blanks which the growth of a year or two will not conceal, is fairly started on the course of healthy development, which it is to continue undisturbed until it reaches the age of fifteen years.

At this point occurs the first of a series of thinnings which follow each other at intervals of seven or eight years, until the trees have entered the last third of their existence. There is, perhaps, no silvicultural question more in dispute than this of the time and degree of thinning which will yield the best results in quality and quantity of timber. The method pursued at the Sihlwald, consecrated by habit and success, gives ample space for the healthy development of the crown from a very early age without admitting light enough through the leaf-canopy to sustain an undergrowth until the trees are nearly ready to give place to their descendants. Such shrubs or seedlings as still appear, thanks to a shade-bearing temperament, are systematically cut out. It may be strongly doubted whether such a policy might safely be applied on soil less moist than that of the Sihlwald; but here, at least, the trees reach the age of sixty years, tall, straight, clean-boled, and in condition to make the best of the last part of the period of maximum growth, which a large number of measurements have shown to occur in general between the ages of seventy and ninety years. A heavy thinning now comes to the assistance of the best specimens of growth, and they are left to profit by it until seven years before the date fixed for their fall. Then begin the regeneration cuttings, whose object is to admit through the leaf-canopy an amount of light, varying with the temperament of each species, whose mission is to give vitality to the seedlings which the trees, stimulated themselves by their more favorable situation, now begin to produce in considerable quantities. To this end the light which falls from above has a powerful auxiliary in that which the system of felling each year in a long, narrow strip admits from the side, and so admirable is this double method that the time which elapses between the beginning and the end of a regeneration is but half the average for less favored localities. This applies only to the deciduous trees. The time required by the conifers is much longer, and the incomplete regeneration which they furnish is supplemented by planting in the blanks already mentioned. But for the self-sown seedlings of both classes the amount of light is gradually increased, the trees which sheltered them are at length wholly removed, and the cycle of growth repeats itself.

The wagon roads which once served for the transportation of the timber thus produced, although admirable in plan and construction and still thoroughly maintained, have been almost wholly superseded by a system of timber slides and narrow gauge railroads, in which gravity is the motive power. The timber, loaded directly on the cars of the light, portable track laid in the forest (see page 383), or, where the surface is broken, hauled to them by tough little Swiss oxen or carried down on hand sleds which are capable of taking enormous loads, is delivered at the head of one of the slides. Thrown in at the top of the V or U-shaped canal of boards or poles, it rushes down the steep incline of the slide with a speed which often shoots the sticks of cord-wood through the air for a distance of one hundred and fifty feet as they rebound from the iron-clad platform at the foot, and not infrequently tears apart great logs in the violence of the fall. Piled once more on the cars, this time of one of the two permanent tracks which follow the bottom of the valley at divergent levels, the timber pursues more quietly its journey to the mill, whither it arrives in trains of from five to twenty cars under the guidance of a single brakeman. Such a system of transportation is only possible where considerable amounts of timber are cut on limited areas, but its application to the Sihlwald has resulted in so steady and marked a decrease in the cost of moving the produce of the forest to the mills that its value under similar circumstances may be taken to be proved.

Nancy, France.

Gifford Pinchot.

Correspondence.

Our Schools and Gardening.

To the Editor of GARDEN AND FOREST:

Sir.—I have lately had occasion to discuss elsewhere the subject of our common school education as bearing on rural life, horticulture and farming. This was recalled to me by an editorial recently in GARDEN AND FOREST on horticultural education. Agricultural colleges are of value in their way; but they are too far along and their influence is exercised too late. A boy, graduate of our common schools and sent to an agricultural college, goes charged with a popular bias in favor of trade. It is a simple fact that commerce in any form is held to be honorable, but land-tillage is looked down upon. My friend Parker can retail my potatoes, peas and berries, but the raiser of vegetables and berries for market, and the first sale of the same, brands one as belonging to a lower caste. It needs considerable decision to get on a load of cabbages and take them to market. Now, I have learned to trace this error in public judgment to a foundation or causal error in education. The trouble in this case is that our schools are in no sense whatever adjusted to farm life and farm work. "Any one can be a farmer. It needs no special education to grow onions." This is the public sentiment that must be corrected, and with it the false methods of study. There will be no demand for higher education in horticulture or agriculture until pupils are started in the right direction in the common schools.

A man who sends his boy to school with the direct purpose of qualifying him to comprehend and love the things which come under his eye and other senses, and in order to enable him to enter into sympathy with his work in the field, will be disappointed. The horticulturist needs to understand vegetable and animal life—their history and evolution, the possibilities involved in climatic and other environments—and should be prepared for the comparative and experimental cultivation of plants, trees and animals. Will the curriculum of the common school prepare the boy or the girl in these directions? Out of this they get neither botany nor zoology; neither horticulture nor gardening in the narrower sense; neither a knowledge of soils, nor of rocks, nor of vegetable chemistry. What is given to the child is more specifically that which inclines him to trade, and away from land culture. It will not do to rely on a higher training after the bias is given. The suggestive plan proposed by GARDEN AND FOREST and by Professor Bailey, covers the advanced need of a pupil already under way with elementary biology. But until our schools specifically recognize, from the outset, the dignity of gardening and field work, education will unfit, rather than fit, us for being an agricultural people.

I am persistent in beginning with all my children at a knowledge of soils and rocks, the land under their feet, and its make-up geologically. Then I pass on to the life on the earth—vegetable and animal. So long as I can find an elementary book like that of Professor Shaler there is no trouble with geology. As for zoology and botany we are also fairly well supplied with good books. Chemistry in laboratory work follows. And so the lads from ten to twelve years of age have a knowledge first of all of the world about them and the life on it. It is mostly field work and laboratory work; and with it goes drawing, from the outset. Such a course gives them a passion for the soil and plants and animals, from the beginning of their mental development. I may add that they never think of such studies as tasks, but as enthusiasms. I do not advocate directing a boy to land culture when he has a marked taste for machinery or for literature; but the retention by wise and fitting education of those who naturally should be farmers and gardeners.

Clinton, N. Y.

E. P. Powell.

Bermuda Grass.

To the Editor of GARDEN AND FOREST:

Sir.—The grass on the lawn of your correspondent at Frankfort, Kentucky, "making a growth all through June," is doubtless the Bermuda Grass (*Cynodon Dactylon*), as you have determined it; but it is not usual to find it troublesome where other lawn grasses will grow, and this experience with it in Frankfort is very interesting. The foliage of this grass is so easily killed by frost that it does not seem able to gain a foothold north of the Potomac. Botanical works give its range as from Pennsylvania southwardly; but I have never been able to find a specimen except in the ballast ground near Philadelphia, where it occasionally springs up from the seeds brought in the ballast, but does not spread beyond. In the admirable list of the "Flora of New Jersey," from the pen of Dr. Britton,

just published as part of the work of the Geological Survey, it is noted only in a few instances on wharves or in ballast heaps.

That it rarely seeds in the United States is, I think, a popular error. It flowers rather early, and before its later creeping habit begins. In that state it attracts popular attention, and there no seed vessels are seen. Years ago, when examining the horticulture and agriculture of Louisiana and Mississippi, Colonel Hillyard, now of New Orleans, remarked to me on one occasion near New Orleans, "They say this never seeds. Look, it is abundantly seeding here." Again, some years later, I was crossing the then unfinished grounds in front of the new National Museum at Washington with Professor Porter, of Easton, who called my attention to the abundant fruiting of the grass on that waste ground. A specimen that I gathered there I subsequently sent to Doctor Thurber, who had given currency to the non-seeding reputation of the Grass.

The "dwarfed, late-starting Grass of the northern states, so destructive to northern lawns" (page 363) is probably *Panicum sanguinale*.

Germantown, Pa.

Thomas Meehan.

Recent Publications.

Les Champignons, Traité élémentaire et pratique de Mycologie suivi de la Description des Espèces utiles, dangereuses, remarquables. Par J. Moyen avec une Introduction par Jules De Seynes. Paris: J. Rothschild. Pp. xxxv., 762, 20 chromolithographs and 334 wood-cuts.

The French certainly understand the art of making popular treatises on natural history. To artistic skill in the production of plates they generally add a style which, although approaching diffuseness, is clear and easily followed. The present work, in spite of its 800 pages, is so well arranged that the reader can easily find what he wants to know and read it quickly. It is one of a class of books of which a considerable number have appeared in the last few years whose object is to give to the unscientific, or mildly scientific, reader a general view of the forms and properties of all kinds of fungi and a more detailed knowledge of the species which are edible or poisonous. It contains a large amount of information, and we do not know any better elementary work of the same scope. The numerous wood-cuts are a great help to the beginner who wishes to study the subject from a botanical point of view, and the amateur who is only in search of some ready means of recognizing the principal edible and poisonous forms will find the colored plates a practical aid. The larger part of the text is devoted to a "Flore Mycologique," or description of the most important *Basidiomycetes* and the larger *Ascomycetes*, followed by an artificial key to the species and a glossary of technical terms. The medical man would perhaps prefer the work of L. M. Gautier, *Les Champignons*, and the expert mycologist would require more technical works, but the present book is to be recommended to those general readers and amateurs who desire to begin the study of fungi, for it offers in a condensed and simple form the substance of a good many books. The reader may perhaps feel that too much is given, but that error, if it be an error, is one easily pardoned.

Notes.

California nectarines are in the market, and very good they are. Some of the California peaches, too, are fair, and there are few others to be had in the city. Jamaica oranges are just coming.

In an article on the "Botanic Gardens at Kew," recently published in the *Popular Science Monthly*, it is said that between six and seven hundred thousand persons visit them in the course of a year.

It is reported in the *American Agriculturist* that a rust has appeared on the Canada Thistle. The fungus spreads rapidly and is very destructive of the host plant, which is well known as one of the most pestilent of weeds.

We are advised that Hill & Co., proprietors of the Rose Nursery at Richmond, Indiana, have retired from the retail business. Hereafter the Messrs. Hill, in a new location not far from the city, will limit themselves to a wholesale and novelty trade.

Clethra barbinervis, obtained from Japan through Mr. Thomas Hogg in 1875, is now in bloom at the Kissena Nurseries, Flushing, and a very striking shrub it is. It is a strong grower, with leaves six and a half inches long and three inches wide on leaf stems one inch long. The flowers are pure waxy white, with white pistil and stamens, and they are arranged in racemes six

inches long. The plant is specially valuable because it blooms when few shrubs are in flower. Mr. Parsons reports that it is sometimes affected slightly by the winter.

The proceedings at the fifteenth annual meeting of the American Association of Nurserymen, held in this city last June, have been promptly published in a neat volume of 100 pages, with a portrait of the President for the coming year, Hon. S. M. Emery, of Minnesota.

An exhibition of jams, bottled, preserved and dried fruits of all kinds, is to be held in London under the direction of the Royal Horticultural Society, on the 14th, 15th and 16th days of October next. The chief object of the exhibition will be to show the advance which has been made during recent years in processes of preserving and drying edible fruits for consumption. For the schedule of premiums and other information application should be made to the Secretary of the Royal Horticultural Society, 117 Victoria Street, London, S. W.

The American Forestry Association has accepted the kind invitation of the Government of the Province of Quebec to hold its annual meeting in the Parliament Buildings, Quebec, from the 2d to the 5th day of September. While the conditions under which the Association will meet are a guarantee for earnest and useful work in the cause of forestry, the historical city of Quebec, with its beautiful surroundings, will also help to secure a large attendance. All persons who intend to read papers at the meeting are requested to send the title to the First Vice-President, Honorable H. G. Joly, 15 Buade Street, Quebec, before the 15th of August.

Captain Hayward is the name of another finely colored and scented new Hybrid Perpetual Rose, sent out by Mr. Henry Bennett, of Shepperton, and a correspondent of *The (London) Garden* speaks of it as a valuable addition to a long list of good things this raiser has produced. The flowers are very showy, and remind one when fully expanded of those of Ulrich Brunner, but they are quite distinct. Their color is rich crimson, shaded with a bluish tone when open, while the scent is strong and rich. The vigor of the bloom and stem indicates unusual robustness in the plant, and if this proves true then we have a welcome Rose of fine, bold character for the garden.

Different *Kœlreuteria*-trees vary considerably in their time of coming into bloom. This year we observed one in full flower on the fourth of July and near it is another which is still in flower. The trees vary greatly also in the appearance of their fruit, which stands out above the foliage in large spreading, bladdery panicles. In some the color is a very soft, light yellowish green, while in others even at their earliest appearance the color is a rich reddish bronze. The *Kœlreuteria* is one of the most interesting of small trees at all seasons. Its foliage is abundant and healthy, and rarely visited by destructive insects. The great panicles of bright yellow flowers make it a striking object when in bloom, and the fruit, until it dries up and turns brown, also adds to its effectiveness.

The carelessness with which writers in popular journals speak of trees was shown in a recent number of the *Pall Mall Gazette*, when the fabled "World-tree," believed in by northern nations in Pagan times, is spoken of. New Yorkers have had a picture of this "World-tree" put before them of late in Wagner's opera, where Siegmund draws from its giant trunk the enchanted sword, and many will recollect that in the text it is called an Ash—*Esche*. Such in fact it was thought to be, and it is well known that the Ash, like the Oak, long retained its sacred character among the Germans even after they were christianized. Yet the writer referred to calls the "World-tree" a "Mountain Ash." This does not mean an Ash at all, as every one should know, for the tree is common everywhere in cultivation, but a tree of another family altogether, one which never grows to large dimensions and belongs in the same genus with the Apple and Pear.

The people of Florida believe that there is a prosperous future for the Pomelo as a summer fruit. This fruit varies in acidity. In most varieties the acid becomes agreeably mild in May, but in many instances it remains strong until midsummer, so that by proper selection and management good fruit can undoubtedly be had all through the hot season. In the middle of July some fine fruit appeared in the Jacksonville market and sold there at ten cents apiece. The *Lakeland Advocate* quotes returns for seven boxes of bright Grape-Fruit in good condition, each box about the size of an ordinary orange-box and holding some fifty fruits, and they netted the grower more than eight cents apiece. This is said to be the highest wholesale price yet received, but certainly it is not more than the real value of the fruit, which many people

consider superior to the orange. It should be eaten so as to avoid the bitter flavor of the peel and the core, the best method of preparing it being to peel the fruit first and then carefully to separate the pulp from the remaining integuments.

Quoting from an Italian journal a writer in the *Bulletin of the Torrey Botanical Club* for July says with regard to the naturalization of American plants in France: "In 1881 on the banks of the Meurthe, near Nancy, a few specimens of *Lepidium Virginicum* (Wild Peppergrass) were found among growths of *Lepidium ruderale* (a European species which is sparingly adventive in this country), and two other adventive American plants, a *Gilia* and *Amsinckia lycopsioides*. They lasted about ten years and disappeared along with the manufactory of flannel shirts, to which they probably owed their origin in that place, as the wool used in the looms (presumably brought from Chili) was cleaned in the river and spread on its pebbly banks to dry. *Lepidium Virginicum* disappeared with the rest of the foreigners, but several years later was found again near Nancy, and, with *Poa pœooides* and *Salvia verticillata*, is spreading along the railroads. *Oenothera biennis* and *O. muricata* are adventive on the banks of the Moselle and abundant there," while the same Peppergrass, which has been so persistent at Nancy, has been known for forty years in one spot at Bayonne, and has spread through the departments of Landes and Basses Pyrénées, "where it is now abundant in waste places and along railroads."

The State Analyst of New York State having recently been requested by the Secretary of the State Board of Health to give his opinion with regard to the wholesomeness of cotton-seed oil and of lard and lard compounds into which this oil enters as a component part, has replied as follows: "I am clearly of the opinion that cotton-seed oil, whether used alone or commingled with other oils or fats, is a perfectly wholesome and nutritious food, and as easily digested and assimilated as any of the commonly employed fats. In support of this view the opinion of numberless writers upon the subject and of experts in chemistry and physiology might be adduced. Throughout the cotton-growing states it has been for a long time very largely used, and the medical faculty of the Arkansas University say that it is to be preferred to other fats in many respects, 'agreeing with the most delicate stomachs, whether used in baking or frying,' and that 'not one instance has ever been given of health being in any manner impaired by the use, however free, of cotton-seed oil in food.' They say that 'thousands of hands employed in the cotton-seed oil mills are in the habit of making their dinners on the crude oil by dipping their bread in it, and some of them actually drink it, and yet from this free use of it nothing has ever resulted but the best of health.'"

Professor B. D. Halsted in an article entitled "Observations on the Doubling of Flowers," published in the *Popular Science Monthly* for July, cites this instance of a doubling process. "In the *Petunia* the doubling of the flower is usually accompanied by a remarkable modification of the pistil—in short, a secondary flower is formed within the ovary. Botanists have long recognized an exceptional development of the floral axis which has been termed proliferation. In this there may be a prolongation of the axis beyond the blossom, and the development upon it of ordinary foliage. The European Larch furnishes a good illustration of this. Sometimes an ordinary leafy stem extends upward from the centre of the cone for nearly a foot. In rare cases leafy branches have grown out from the free or blossom end of pears, and buds and long branches have arisen from the centre of a rose. In the *Petunia* this proliferation, if we may call it such, assumes the form of a small and much contorted flower. Repeated examinations of normal flowers fail to show any unusual structure to the pistil. It is, therefore, associated with the doubling process in the *Petunia*. Instead of the end of the floral axis, which terminates at the base of the single centrally situated pistil, remaining as such, it develops into another flower, and this within the ovary of the primary blossom. Just why we should have this peculiar form of proliferation, or any, in fact, is not for us to decide. The ordinary forces which would construct a normal flower have been thrown into confusion, and retrograde metamorphoses and floral proliferation have resulted. In fact, it seems evident that out of the substance ordinarily producing a capsule of *Petunia*-seed has been formed in the same ovary an amalgamation of stamens, petals, and a rudimentary pistil. In short, the tendency to petaline display does not stop with the stamens, but invades the pistil, and transforms it as already described."

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Country Roads.

THIS is the season when country roads make one of the staple subjects of complaint by the persons who have fled from the stifling heats of the city. These visitors, on recreation bent, find few inviting foot-paths when they wish to walk, and after returning from their first attempt to drive they usually write a letter to some newspaper complaining that the roads are stony or shadeless or dusty or muddy. It would seem that rural neighborhoods which lack the spirit or enterprise to keep good roads for their own comfort and profit would care little for the displeasure of transient visitors, but really the money brought into many country communities by summer visitors forms a considerable item in the sum total of their earnings for the year. Special attractions in the way of beautiful scenery or health-giving springs or pleasant lakes make a capital which often yields a remunerative income, and if all the attractions of perfect roads were realized it might be found that the money used in securing them would prove a most profitable investment by serving as an additional inducement to turn the tide of summer travel in their direction.

It is easy enough, however, to exhort persons to improve their highways, but it should always be remembered that special training and experience are required for the construction of a satisfactory road. Certain it is that a group of farmers who gather once a year to repair the roads can accomplish very little that is effective in this direction, and even when repairs have been made properly, and the road is left for an entire season to take care of itself, it will be as bad as ever when the annual mending-time comes round. Every year it is becoming more generally understood, as we are glad to know, that the roads must be made well in the beginning if they are to be kept well thereafter, and that slight repairs made during the year as they are needed are altogether preferable to the practice of repairing once for all. When roads are once well drained and well constructed the money which is annually expended upon them under the old system, with no satisfactory result, would amply suffice to keep them in excellent condition if it was entrusted to some competent engineer in charge of

the entire district. Many of the states have already adopted this township plan, under which all the road repairs are entrusted to a selected officer, and this is a marked improvement upon the old district plan, where the farmers worked out their tax. The necessity, too, of adequate training in this matter is so far recognized that a course of study in road-making forms a part of the curriculum of several of our agricultural colleges and some other universities. The invention of road-machines has also proved of great advantage in this respect, and although the material used is too often the scrapings of mud and soil from the gutters instead of gravel or pounded stone, nevertheless the roads repaired by machinery are usually much superior to those worked on the old system. Some of the states, too, have passed enactments by which the repairs of the main thoroughfares are provided for by a general tax, while only the cross-roads and by-roads are left to be cared for by the communities through which they pass, and the result of it all is that the roads in the eastern part at least of the United States are materially better in every respect than they have been in former years.

But even a good road—that is, a road which furnishes a smooth wheelway—may be an unattractive one, and it is worth while once more to call attention to the treatment of the road borders. Rural improvement societies, which have planted road-sides with shade trees, have done much in various parts of the country to mitigate the heat and dust which make driving unpleasant. Of course, it is not always advisable to plant a formal line of trees along winding roads and through a hilly country, but, as a rule, it will be found that trees however planted are better than none. We know of few instances, however, where systematic efforts have been made to preserve the growth of shrubs and wild flowers which spring up of their own accord. We have in a former number called attention to the work of the gardener of a great estate not far from this city who has thoughtfully planted the seeds of wild flowers along the bordering shrubs, which have been allowed to remain and fringe the road-side. Where one can see Blood-root, Bluets and Lupin with Cone Flowers, Painted Cup and Golden Rod and an increasing number of Ferns and Mosses embroidering the ledges of road-side thickets the way can never be uninteresting from early spring till late autumn, and even in winter, where the berries of the Black Alder and the hews of Wild Roses are left to glimmer among the soft tints of the leafless twigs of the shrubbery, the eye finds something to delight in.

Too often, however, all efforts at improving the wayside are made with the grubbing hoe and brush hook. The tidy farmer does well to cut down the brush along his fences, which otherwise would keep constantly encroaching upon his land, but this practice is not a virtue when it is extended to the fences which border the highway. It is true that in smooth and level countries where the wheelway is bordered by a greensward which is connected naturally and under open fences with the grass of the meadows and pastures, there is propriety in keeping down all other growth; but in stony and hilly regions where the bushes are cut away and nothing is left but raw ground and stumps the effect is unsightly. No formal planting can be more beautiful than the spontaneous growth of Nature's furnishing where the roads are lined with thickets of Black Haw and Cockspur Thorn, Sumac and Hazel Nut, with the Wild Grape clambering over the stone walls and festoons of Bitter Sweet swinging from the trees overhead, and Clematis and Ground Nut and Moonseed rioting over the shrubbery. No park-planting can excel such masses of foliage, and from the time when the June-berry and Dogwood and Wild Plum blossom in the spring, with Viburnum and Elder, Honeysuckles and Roses following in close succession, until the yellow Witch Hazel blossoms brighten up the border in late autumn, there is no lack of flowering shrubs. All that is needed to produce the most beautiful effects in this line is to allow these wild places to clothe themselves, to restrain the too rampant growth of the

stronger plants when they become too aggressive, and add an occasional touch, perhaps by setting some low-growing shrubs like Red Root and Sweet Fern on the edges of shrub belt, or planting some wild flowers in suitable openings.

Farmers often complain of the rates charged by transportation companies, but it would be easy to demonstrate that the carriage of farm products by rail and steamer, all combined, costs much less than the hauling of these products over country roads from the farm to the nearest railway station. This is not the place to enforce the argument for good roads by showing how much more rapidly and cheaply this hauling could be done if the roads were all good and in good condition. But, certainly, it is worth while to invite the attention of country landholders to the value of attractive roads. The first impression which a visitor receives of any region comes through its roads, and as he leaves, his last experience is on the road over which he is driven to the station. Every day, when he is not shut within doors, he makes use of roads and paths, and, although he may not realize the fact, a large portion of his pleasure or discomfort is due to their influence. Good roads pay by reducing bills for repairs of wagons and carriages, by saving time, by economizing horse power and in many another direction. The absolute money value of attractive roads to any country community is just as real and positive. They give an added value to every acre of land in the districts which they traverse.

THE people of California seem inclined to resent the statement of Major Powell that "the forests of the upper regions are not advantageous to the people of the valleys who depend on the streams for the fertilization of their farms." *The Century Magazine* for August publishes a letter from Mr. Abbot Kinney, who states from personal observation that in many cases the clearing away of the mountain forests has caused torrents in California which make the bottom-lands unsafe and he corroborates his experience by a number of references to leading authorities to show that the Major's theory is at variance with all the known facts of the case. A strong article, too, lately appeared in the *Alta California*, setting forth the dangers which threaten the forests of the western portion of the continent and expressing the views of all who are familiar with the forest-problems of that region. We quote a portion of this article which refers to forest-fires:

"Forest-arson is already in progress in California. The smoke from burning forests is beginning to soften the sunshine. It hangs over the waters of the bay and gives to all landscapes in every direction the soft and fine effects peculiar to the Indian summer in the east. These effects are purchased at too great cost, however. Thousands of acres of the noblest timber in the world will be sacrificed by fire between now and the first rains next fall. As usual, these forest-fires begin with the driving of sheep and goats into the mountains. In the coniferous forests there is not much pasture for these animals. The ground is covered by a carpet of the fallen needles and resinous cones. Under the Pines the Azalea grows. The sheep browse it, but it poisons them. Fire kills the timber, and when the carpet of cones and needles is destroyed some pasture will grow for a time. Fire also removes the Azalea. Is it at all remarkable, therefore, that fire is left in the track of the shepherd and his sheep? California mountaineers, who have practical knowledge on the subject, express their surprise at the views of Major Powell, of the United States Geological Survey, upon this subject, published recently in *The Century*. He strongly urges the good effect upon the forests of running sheep in the Sierras, and announces it as a prime method for preserving timber! A summer in the Sierras would work a change in his opinions."

The story of the wasting of the forests of the Sierra Nevada cannot be repeated too often; nor is it easy to overestimate the injury which Major Powell's utterances about forests in general are likely to work, coming as they do from the highest scientific officer of the Government. Positive opinions from such a source are apt to receive attention, especially when they appeal to selfish interests; and

Major Powell's recent remarks about our forests must bring great comfort to all the army of men who live illegally in one way or another on the forests of the public domain. As long as the officer, whose duty it is to furnish scientific information to the Government, declares that the forests of the western mountains are an injury to the country, timber thieves will continue to cut and shepherds will continue to burn these forests with new energy and with diminished dread of punishment.

White Park, Concord, New Hampshire.

THE capital of New Hampshire is a pleasant city of some 15,000 inhabitants. Its main street lies near the bank of the River Merrimac, and its residence streets stretch along the slopes of hills which rise irregularly west of the stream. Beyond the older streets, but surrounded by modern ways, is a small tract of land which is in part so precipitous and in part so swampy that all the new roads have avoided it. On this rough land is a fine growth of large trees of many sorts, and, although it lies only half a mile from the centre of the town, many of the most interesting New England wild flowers bloom in the shelter of its woods and hollows.

This tract of about twenty-five acres has been presented to the city of Concord, and is called White Park for the donor. A commission of well known citizens has been placed in charge of the work of fitting the ground for the use and enjoyment of the people, and they have wisely begun their labors by devising and adopting the general plan which is reproduced on page 395.

The Commission intends to make the park a place of quiet resort for people who cannot take the time or who have not the strength to go often to find refreshment in the open country. No carriages are to be admitted, not only because the acreage is small and the slopes steep, but also because it seems unfair to injure the park for the use of children and pedestrians while innumerable pleasant country-drives are close at hand. No elaborate gardening will be admitted, not only because it is costly, but also because it would be incongruous. Every city of the new West may have its carpeted "park" if it so wishes, but Concord proposes to seize her opportunity to provide for her citizens and their posterity something very much more valuable. She will set aside and preserve, for the enjoyment of all orderly townspeople, a typical, strikingly beautiful and very easily accessible bit of New England landscape. Would that every American city and town might thus save for its citizens some characteristic portion of its neighboring country! We should then possess public places which would exhibit something more refreshing than a monotony of clipped grass and scattered flower-beds.

The plan adopted by the Commission provides for the enhancement of the natural beauty of the park by spreading water in the lowland where nature made a marsh, by making grassy glades in two or three hollow parts where nature grew Alders and Birches, by planting a thicket of Mountain Laurel here and opening a vista to the Merrimac there; and then the plan leads paths in such directions and by such routes as will best display the beauty of the place while injuring it least. In the opinion of the Concord Commission, a path, far from being a chief beauty of a park, is only an instrument by means of which it is possible for large numbers of people to pass through the midst of beautiful landscape without seriously injuring it.

The variety of limited scenery which White Park will present when it is finished is great. Just within the main gate (at the end of the plan on the left) will be a level of green sward, bounded on three sides by rising banks, from which hang thick woods of deciduous trees. At one end the banks draw close together, and here is a deeply shaded dell, from the head of which a path climbs by steps to the street. Two other paths lead up from the green, by little hollows in the skirting bank, to a plateau where Pitch Pines stand in open order, and the ground is carpeted with their needles. A steep-sided, curved and densely wooded ridge in turn bounds this plateau, and beyond it, and nestled in the curve at its base, is a tiny pond, fed by strong springs, and overhung by tall White Pines. Its waters overflow, by way of a steep and stony channel, into a much larger pond, with shores but little raised above the water, which occupies the southern third of a long level, through which a slow brook meanders. The shore of this pond, and all the flat land near the brook, is scatteringly wooded with large deciduous trees. Paths reach little beaches on the shore at several points. Beyond the head of the pond a path leads to a "shelter" on a knoll in the midst of deep

woods, and thence by a sharp ascent to a high point on the very edge of the park, whence a pretty view will be had of the pond at one's feet and the Merrimac Valley beyond, with the state-house dome in the middle distance and near the middle of the picture. All things considered, Concord is in a fair way to possess one of the most charming small parks in America.

Why are gifts like this of Mrs. White to Concord not more common? Can any more valuable present to posterity be imagined? Perhaps they may be commoner when it comes to be known that there are now several park commissioners in this country who do *not* consider it their first duty to destroy the beauty which nature provides. Real landscape art is nothing if it is not broad, simple and conservative of natural beauty. It is elaborate and gardenesque only in special circumstances. Its old name of "landscape-gardening" must be discarded at once, if the definition in the new Century Dictionary is correct. Landscape art does not consist in arranging trees, shrubs, borders, lawns, ponds, bridges, fountains, paths or any other things "so as to produce a picturesque effect." It is rather the fitting of landscape to human use and enjoyment in such manner as may be most appropriate and most beautiful in any given spot or region. When this is generally understood by the public and practiced by the profession, parks and country-seats will be so designed as to be not only well arranged and beautiful, but beautiful in some distinctive and characteristic way, as is White Park at Concord.

The Alleghanies of Virginia in June.—II.

THE long, low colonial house at Eggleston's Springs, where we spent the night after leaving Salt Pond Mountain, stands in the centre of a wide, shady meadow, on the edge of the swift, muddy New River, and a few hundred yards below it are the fine limestone cliffs that rise up perpendicularly out of the water, several hundred feet high. The climb over a rough, stony trail to the top of this cliff is well repaid by the view of the curving stream and its beautiful, wooded banks.

On the highest ledge of the great buttresses grows the rare *Pachystima Canbyi*, a low evergreen shrub, only a few inches high, with narrow, serrulate leaves and curious yellowish roots. There is very little of it on the ledges; most of the plants, perhaps fortunately for their future, are quite inaccessible. It is in very select society, too, up there on its rock. *Berberis Canadensis* is close by on the edge of the precipice, so is *Rhus Canadensis*; and on the shady side of the cliffs, the Walking Leaf (*Campnosorus rhizophyllus*) "walks" over the mossy rocks, and quite a little company of Spleenworts (*Asplenium Rutamuraria*, *A. parvulum* and *A. Trichomanes*), grow close together under an overhanging boulder. Two pretty little white-flowered plants, *Arabis lyrata* and *Draba ramossissima*, grow on the cliffs, and *Clematis Viorna*, the Leather Flower, was in both flower and fruit. The long vines were covered with the dark reddish purple bells and the round, fluffy balls of the plumose-tailed fruit, and they climb over the bushes and hot rocks, where all down the face of one of the cliffs, in the blazing sun, the dainty, frail-looking little *Arenaria Michauxii* blooms undisturbed, and the pale, stiff *Pellaea atropurpurea*, the Cliff-brake, grows out of the many cracks. *Asclepias variegata* was just beginning to open its compact umbels of white along the path, bordered by dense clumps of *Rosa humilis* and little straggling patches of *Pentstemon pubescens*, where the air was heavy with the fragrance of innumerable wild Grape vines.

Our next mountain trip was from Buchanan, on the beautiful James River, to the Peaks of Otter, in the Blue Ridge, Bedford County, and beyond the assurance that there was a hotel near the Peaks, we could get no information from the natives at the station. It had rained heavily while we were in the train coming from Natural Bridge, the dust was laid, and from the start the scenery was finer, the forests older and in better condition, and last, but not least, the roads smooth and level in comparison with those on Salt Pond Mountain.

The picturesque Scrub Pine (*Pinus inops*), growing close to the road and scattered over the hills, made a delicious fragrance through the moist woods. The pretty Chinquapin (*Castanea pumila*) was in full bloom, and at a turn in the road, on the edge of the dense jungle, was a great clump of it against a background of the large, shiny leaves of the Black Jack Oak (*Quercus nigra*) and tall, overhanging branches of the Sorrel-Tree (*Oxydendrum arboreum*). The latter is almost a small tree in some of the thickets, its long finger-like racemes then covered with little round buds just ready to burst into bloom. The most striking plant on the first ascent is the Goats-beard (*Spiraea Aruncus*), with tall, compound panicles of pure white, feathery flowers. Big bunches of *Tephrosia Virginiana* fill the spaces between the bushes with pretty pink and yellow spikes, and the Fire Pink (*Silene Virginica*) makes a splendid show, for

anything more brilliant than its bright crimson stars would be hard to imagine. Two golden-yellow flowers, an Evening Primrose (*Oenothera glauca*) and *Coreopsis verticillata*, were abundant on the road embankment, where the little dark red-flowered *Galium latifolium*, the graceful pink clusters of *Asclepias quadrifolia* and the stiff, white-flowered *Euphorbia corollata* grow side by side.

A little further up on this same embankment we found the wonderfully pretty little relative of Shortia, *Galax aphylla*. The glossy, heart-shaped leaves are a bright light green, closely covering the ground, and row after row of the tall, stiff spikes stand up all through the underbrush. It had been just ready to bloom ten days earlier on Salt Pond Mountain, but here it was at its height, for the tall stems were covered to their tips with the beautiful little white flowers. When we reached the top of the first hill we saw for the first time *Kalmia latifolia* in all its glory of bright pink buds and great round bunches of white flowers. We drove up through tall hedges of it, the straggly, Japanese-looking shrubs filling the swamp with patches of white against the light green young woods beyond; and all around the edges of the marsh we found *Oakesia puberula*, *Anemone trifolia* and *Pogonia verticillata*, all three already in fruit, and on the top of the hill *Parthenium integrifolium* and *Anianthemum muscatoxicum*. This latter plant, belonging to the Lily family, has tall spikes of flowers, and was so abundant that the whole swamp was a waving mass of white, while over everything twined and twisted the large, pointed leaved vines of the Wild Jam-root (*Dioscorea villosa*).

The road-sides are bordered by splendid round-topped Chestnuts, *Magnolia acuminata*, in plenty, and here and there a few Hemlocks along the water-courses. Some of the Oaks are magnificent, and by far the finest of the larger trees on the mountain.

The road led under the brow of a long ridge for a couple of miles, and at every turn the view grew grander and more varied. It was eight o'clock before we reached the hollow between the two peaks, where we supposed the hotel was. Our colored drivers, who, notwithstanding their protests to the contrary, knew absolutely nothing about road or mountain, were entirely at sea till an obliging farmer informed us that the house was on the top of the mountain, and had been there for the last twenty-five years, and that we could only drive a few hundred yards further, after which we should have to walk up 700 yards or so to the summit. The road was so steep that we all left the wagons and walked in the gathering dusk to the small log hut, where the horses were left, then in the pitch darkness tried to keep in the narrow stony trail, and at ten o'clock, a tired, bruised party, reached the "hotel," a small log cabin and a tiny kitchen, perched between two huge boulders on the windy summit. Mr. Rosser, the proprietor, an old negro servant, and his daughter, the cook, some dogs and chickens, and a flock of wild white Angora goats, are the only inhabitants of this lonely eyrie, from which in all directions we could see, shining out of the darkness far down in the valleys below, the lights of Roanoke, Lynchburg, Liberty and those of the many smaller settlements grouped around them.

The accommodations were not luxurious, but we were passably comfortable, and when called at five o'clock were ready for a day's hard climbing. The sunrise from behind the misty Blue Ridge was a sober one that morning, but the view was magnificent. Range after range of the forest-clad mountains of West Virginia lay to the west, and at our feet a few wooded valleys and foot-hills, and then the wide fertile plain that stretches south through Virginia and North Carolina toward the Atlantic.

In the cracks of the rocks and among the loose stones all about us, but only on the very top of the peak, grew luxuriantly *Dicentra eximia*, the long, drooping racemes of curious pale pink flowers closely resembling those of the cultivated Bleeding Heart. The two ornamental shrubs of the summit, and the only ones, were *Rhododendron Catawbiense*, its big, deep pink bells bright and fresh in the morning light, and the American Mountain Ash (*Prunus Americana*), a very striking little tree, with wide, flat cymes of creamy white flowers. *Diervilla trifida* grows quite bushy not far from the top, and a projecting group of boulders, "The Needles," is carpeted with the small *Paronychia argyrocoma* in dense silvery looking mats. The Wild Columbine (*Aquilegia Canadensis*) was hanging out its bright red and yellow bells up there twice the size that they attain in the valleys. We found *Lilium Grayi* all through the woods, but we were too early for the flowers, as we were too late for those of *Clematis verticillaris* that grew further down.

Asarum arifolium was growing in a damp spot near the

small spring below the summit, and close by on the rocks were pretty little clumps of the delicate bluish *Houstonia purpurea*, var. *longifolia*, and along the road below were great masses of the showy Purple-Flowering Raspberry (*Rubus odoratus*).

The twelve-mile drive on the return to Buchanan was, if possible, more beautiful than the ascent, and when the valley was reached we were unanimously in favor of returning at some later season of the year, for the promise of autumn flowers was enchanting. It would be hard to find anywhere a spring trip offering more beautiful and varied scenery, nor a more easily accessible one. Along the valleys the railroad companies are putting up everywhere charming little "Queen Anne" inns, in which the accommodations and fare leave little to be desired, though off the beaten track, roughing it must be accepted with good grace. The trains are marvels of unpunctuality, and time down there is no consideration whatsoever; but these defects were made up for by the politeness and attention we received from the trainmen and their evident desire to make every one as comfortable as possible.

New York.

Anna M. Vail.

Earliness With Unripe Seed.

THERE seems to be a fair amount of evidence to prove that seeds from immature fruit will give a product requiring less than the usual time to ripen, and that the earliness thus gained can be increased by continuing the selection. The strain of Tomatoes from green seed, mentioned by Dr. Sturtevant in his timely notice of the subject in a recent number of GARDEN AND FOREST (page 355) is still grown in the garden of the Indiana Experiment Station, and with increasing interest. The present season is the fifth generation. A report on the result of this study will eventually be published. Some information gathered from this and other attempts to investigate the subject of the relation of unripe seeds to the development of divergent characters in the product makes clear some points which it will be well to bear in mind in any attempt to apply such a method to the production of early varieties.

It is not the slightly unripe seeds that give a noticeable increase in earliness, but very unripe seeds, gathered from fruit scarcely of full size and still very green. Such seeds do not weigh more than two-thirds as much as those fully ripe. They germinate readily, but the plantlets lack constitutional vigor and are more easily affected by retarding or harmful influences. If they can be brought through the early period of growth and become well established and the foliage or fruit is not attacked by rots or blights, the grower will usually be rewarded by an earlier and more abundant crop of slightly smaller and less firm fruit. These characters will be more strongly emphasized in subsequent years by continuous seed propagation.

In the observations so far made, it has been found that the plant as well as the fruit tends to early ripeness, and so the period of fruitfulness—that is, the time between the first and the last ripe fruit—is much shortened.

With the increase in the amount of fruit there is also a corresponding decrease in the size of the vegetative parts of the plant—that is, the stems and foliage. A Tomato plant grown from green seed in the fourth generation was found to bear three and a half times as much fruit as tops—that is, stems and leaves together—while a similar plant from ripe seed had but one and an eighth times as much fruit as tops.

It therefore follows logically that while earliness may be considered as a usual condition in all crops from unripe seed, an increase in the amount of the crop only occurs when the true fruit is the part harvested, as in Tomatoes and Peas, and a decrease in the amount of the crop occurs when any part besides the fruit is harvested, as in Turnips and Potatoes.

Whether any method can be found to counteract the enfeebling of the plant and yet preserve earliness remains to be seen.

La Fayette, Ind.

J. C. Arthur.

Plant Notes.

Tecoma grandiflora.

THE figure of *Tecoma grandiflora* on page 393 is from a photograph of a plant grown in a pot in a greenhouse and exhibited at the last (June) Rose Show of the Massachusetts Horticultural Society by Mr. James H. Comley, gardener to Mrs. F. B. Hayes, of Lexington, Massachusetts. Mr. Comley states that he received the original plant, without a name, from Mr. John Cadness, of Flushing, New York, some six or seven years ago. For the

last five years the plant has been growing in the open air at Lexington without any protection except that afforded by a stone wall, against which it is planted, and by some surrounding shrubbery, and it seems to be almost as hardy as our native Trumpet Creeper (*T. radicans*), which is its near ally. It blooms freely every year, beginning early in August, and continuing to produce flowers for six or eight weeks, or until checked by frosts. Even when the whole plant is cut back to near the ground a profusion of flowers is produced on the strong, new shoots the first year.

Our figure represents a plant grown from a hard, or ripe, wood cutting, taken from the open-air plant in the autumn of 1889, and therefore about eight months old when exhibited. It is undoubtedly *T. grandiflora*, a Chinese species, which has also been introduced from Japan, where it appears to be known only in cultivation. It was introduced into England in the early part of this century, and in 1811 a figure was given in the *Botanical Magazine* (t. 1398) under the name of *Bignonia grandiflora*.

T. grandiflora is a climbing plant, like *T. radicans*, although it does not appear to grow so rampantly or to produce climbing rootlets on the stems so freely as the latter. The seven to thirteen ovate, pointed leaflets composing each leaf are of a lighter green and more coarsely toothed than those of *T. radicans*, which also differ in being more or less pubescent beneath. Instead of being produced in short terminal bunches at the ends of the branches, the flowers of *T. grandiflora* form large spreading panicles. The young calyx-covered flower-buds gradually taper to a point, and are noticeably five-angled, instead of being rounded and terminating abruptly in a small point, as in our common species. The magnificent bell-shaped flowers are from two to three inches deep, while the wide spreading mouths average three inches across. They are of a bright, light orange within the tube, orange-red with darker streaks on the outer spreading portion, while on the outside they are a soft salmon-yellow. Altogether the colors are much more pure and rich than those of the native flowers.

It does not seem to have been generally known, in this country at least, that this *Tecoma* would flower at so early an age, and therefore it has been suggested that the plant illustrated represents a specially precocious strain or variety. Indeed, it was exhibited under the provisional name of *T. præcox superba*. It is not improbable, however, that any plant of the species when treated in the same way would bloom as early. A plant received from Veitch last year is now flowering in the Arnold Arboretum. Mr. Parsons, of Flushing, who prefers to propagate it by grafting on *T. radicans*, has a plant in a three-inch pot which was grafted last winter and has just now finished blooming.

As already shown, this beautiful *Tecoma* is well adapted for forcing, and it may be propagated by hard or soft wood cuttings or from pieces of the root. For pot or out-door culture the plant may be very easily trained in a dwarf, bushy form.

Like many other exotics this was grown as a greenhouse plant when first introduced into cultivation in Europe, and it may be said to flower most freely when forced by artificial heat.

The plant shown in the figure is now producing flower-buds on new shoots which have been thrown out.

The Virginia Creeper.—This luxuriant climber is the best substitute we have for the English Ivy in cold climates where *Ampelopsis tricuspidata* is not hardy. But those who plant this vine with the expectation that it will cling to brick or stone walls are likely to be disappointed unless they select the variety with much care. The fact that an individual vine of this plant clings tenaciously to the trunk of a tree is no sure indication that it will attach itself to a wall. The tendrils on different plants vary much in their structure. On some they are much like those of the Grape, coiling about objects with which they come in contact, but little branched and producing no sponge-like disks at their extremities. Such vines will climb up the trunks of trees having rough bark, but they are



Fig. 50.—*Tecoma grandiflora*.—See page 302.

unable to attach themselves to walls. In another variety the tendrils branch into several divisions, each of which is terminated by a flat, sponge-like disk that unites itself with considerable tenacity to hard and comparatively smooth surfaces.

On the grounds of the University of Wisconsin the Virginia Creeper is much at home, coming up spontaneously about the

whole campus. Attempts have been made to train it over the walls of the stone buildings, but these have been successful only in a few instances, where the variety was the one bearing the branched and disk-bearing tendrils above described. One variety seems especially well suited to the purpose, the foliage being very dense, the tendrils uniting themselves firmly and

the younger leaves having an attractive purplish tint. The tendrils on different seedling plants exhibit all forms of variation between the grape-like ones and the much-branched, disk-bearing ones.

Nurserymen would do well to propagate varieties with especial reference to their climbing properties, the density and shade of their foliage, and the quality of retaining their leaves after they have assumed their brilliant autumnal hue.

University of Wisconsin, Madison.

E. S. Goff.

Iris Gatesii.—This new Iris, for which we are indebted to the energy and enterprise of Herr Max Leichtlin, has flowered lately in a few collections in Europe. It is larger and more attractive even than *I. Susiana*, hitherto considered the king of the genus. Max Leichtlin is reported to have said of *I. Gatesii* that it has "the most aristocratic appearance of any flower that has ever passed through his hands." Professor Michael Foster, the high priest of the Iris cult, described it last year in the following words: "Imagine a flower often very much larger than *I. Susiana*, of a delicate light gray hue, resulting from minute dots and delicate veins of a rich purple on a creamy white ground, or at times of a pure light sky blue, marked with deeper veins, and at the same time of peculiar grace and form." The plant is a native of Armenia, and requires the same treatment as *I. Susiana*, to which it is closely affined. It was named after the Rev. T. F. Gates, of the American Mission at Mardin. A figure of it from a plant flowered by Max Leichtlin has lately been published in the *Gardeners' Chronicle*.

I learn from Mr. De Graaf, of Leiden, that to succeed with *I. Susiana* and its allies the treatment must be more liberal than is usually afforded. Mr. De Graaf grows these plants by the thousand, and treats them exactly as he treats Tulips and Crocuses—*i. e.*, lifts them and stores them dry for the winter, and replants again in early spring in rich soil in open beds. Those who have tried the dry frame treatment for this section of Irises should try also that recommended, and, moreover, proved most successful, by Mr. De Graaf.

Kew.

W.

Cultural Department.

Notes on American Plants.

ONE of our most showy biennials which blooms the last of July is the *Sabbatia chloroides*, a species of the American Centaury. The whole plant is somewhat slender, seldom over eighteen inches high, with a few not large, oblong-lanceolate leaves. The flowers are single at the extremities of a few slender peduncles about two inches wide and rose colored. They open in the middle of the day and close at night. The plant is often bent down at time of flowering, owing to its slender stems. It inhabits the "borders of brackish ponds" from New England southward, and it seems to prefer a moist, sandy soil on the margin of some pond or stream. When once established in a suitable locality it would no doubt continue from year to year and it is surely one of our most desirable natives.

Baptisia tinctoria (Wild Indigo), a herbaceous perennial, two to three feet high, with many spreading leafy branches bearing numerous light yellow flowers half an inch long near the ends, is a useful plant in many places, and it flowers about the middle of July. The three oval leaflets are about the size of those of the White Clover and much resemble them. It thrives on the poorest sandy plain-land, along the borders of woods or in open fields. Its foliage alone is worth the trouble of growing it, and when once established it seems to require little or no attention.

Calochortus macrocarpus, one of the later flowering species of the Butterfly Tulips, is a plant in greater demand among European dealers than most of this genus. Its large, showy, lightish purple flowers, more than two inches wide, are hardly excelled by any other species. But in our light, sandy soil and climate it is almost a total failure. The plants in early spring showed much vigor and sent up strong flowering stems, but before the buds were half grown the leaves died and only a few flowers ever opened. Perhaps a heavier soil would suit it better.

Cooperia is a genus belonging to the Amaryllis family, of which we have received three species from southern Texas. They much resemble some of the species of *Zephyranthes*, and might easily be taken for them. The plants come from a spherical, medium-sized bulb, have long and narrow grass-like leaves, and naked scapes about a foot high which bear a single white or pale rose flower. *Cooperia pedunculata* is the largest and strongest species and the first to flower by more than a

week. Its more numerous leaves are wider than in either of the others and the plant seems the most desirable of the three. *C. Drummondii* and another called *C. Oberwetteri* are smaller, with narrower and more slender leaves and smaller flowers, coming into bloom about the same time, ten or fifteen days later than the first. Like most bulbous plants from the south they should be wintered in dry sand in a cellar.

Zephyranthes Texana, from southern Texas, has a reddish yellow flower with darker stripes, nearly an inch wide. The outside is still darker. Its foliage is very scant and at time of flowering there is little but the almost naked scape and flower to be seen above ground. Its height is hardly eight inches. The flowers last about two days.

Nemastylis tenuis is a showy little species from Mexico. Here in our northern climate it attains a height of only five inches, but it bears a bright yellow flower, with a slightly darker centre, an inch wide. The leaf is small and not conspicuous, and about all there is visible is the flower and its slender stem. The bulbs are small, half an inch or thereabouts in diameter, and covered with thick coating, to protect them from prolonged drought.

One of our most charming little natives at this season is *Talinum teretifolium*, a low, leafy-stemmed plant, with a peduncle about five inches long bearing an ample cyme of pink or rose-purple flowers over half an inch wide. It acts like an annual, but of this I am not sure. At all events, it flowers from seed the first year, and plants that bloomed last season did not come up this; but the open winter might have killed them. It seems to do best in shade.

The Marsh St. John's Wort (*Elodes Virginica*), with its pink or flesh colored flowers and numerous oblong-ovate clasping leaves, makes a pretty garden plant, now in flower. Its height is about fifteen inches, branching near the top. Its flowers are in small clusters and are about half an inch broad. It is a useful plant for the artificial bog, or it thrives well in any fine loamy soil in the shade or sun.

Asclepias verticillata (Whorled Milkweed) comes into flower the latter part of July. Its height is about fifteen inches, and its very numerous narrow leaves, which are in whorls at regular intervals along the stem, are about two inches long, and about six in a whorl. The flowers are nearly white, in several small umbels at and near the summit of the simple stem. It is an attractive, hardy perennial, easy to grow, and thrives in shade or sun.

The Wild Senna (*Cassia Marilandica*), which flowers here about August 1st, is one of our most valuable native perennials—a member of the Pulse family. Strong roots send up several stout, but simple, leafy stems, three or four feet high and bearing near and at the summit numerous lateral racemes of yellow flowers. Its foliage is fine from the time it matures until frost, and its flowers are also very pretty. It is not partial as to soil, but it will do well in any ordinary garden soil, and may be planted in either spring or autumn.

Tigridia Pringlei (see vol. i., p. 389, Fig. 61) prefers a heavy soil—a clay loam—to that of light sand with little or no clay; and this seems to be the case with most *Tigridias* we have tried. It has greatly improved in the three seasons of cultivation, the old bulbs being more than double their size when first gathered, and they bear larger and richer colored flowers. In one respect it is quite unlike most of the species common in cultivation, and that is, it is not much inclined to increase by the division of its bulbs. This season, in the light soil where we set it, the plants are hardly two-thirds as tall and the flowers are fewer and smaller.

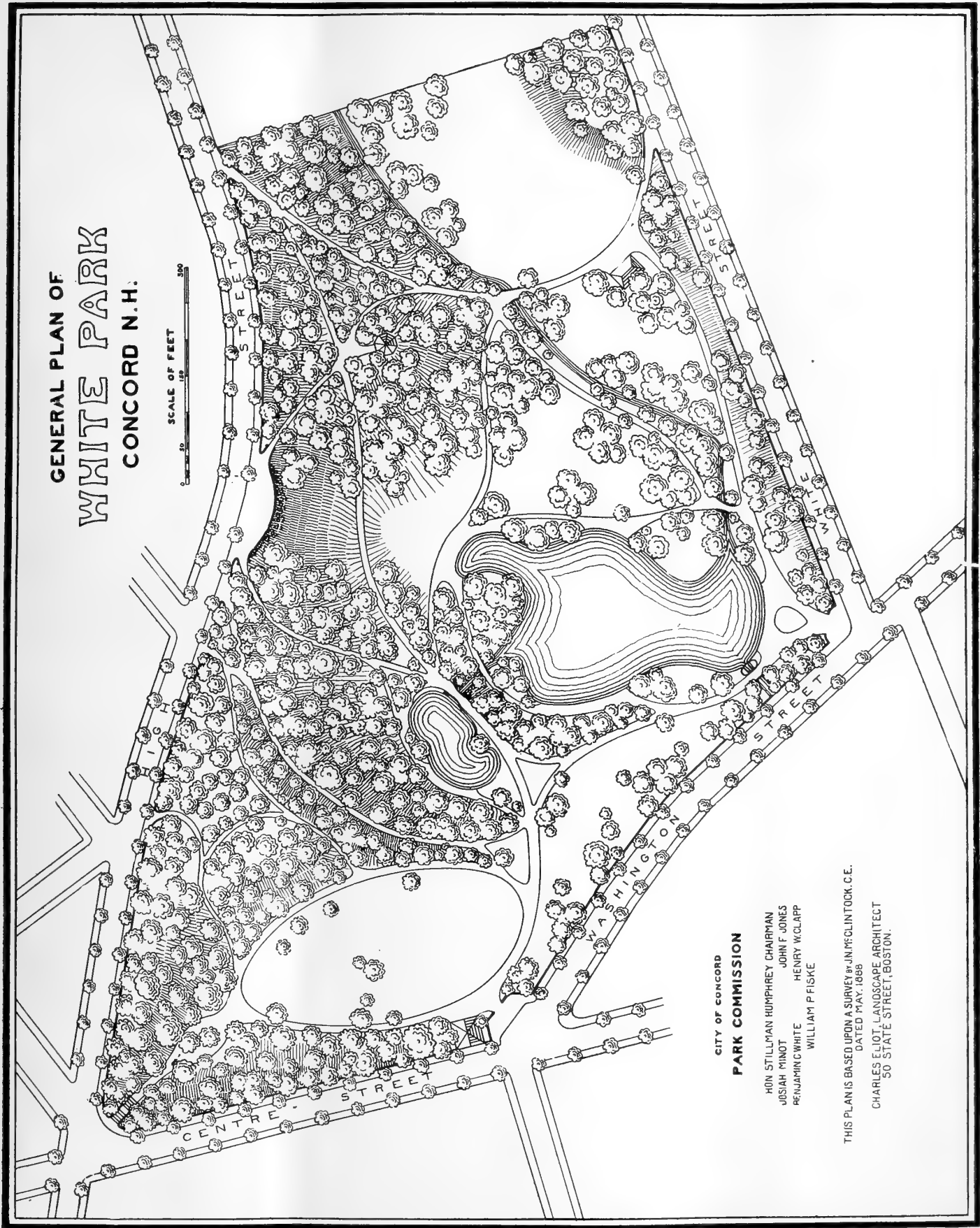
Southwick, Mass.

F. H. Horsford.

Rational Pruning of the Raspberry.

THE Raspberry-plant is a sort of compromise between a perennial herb and a shrub. Its stems are woody, but instead of living on from year to year, and bearing an indefinite number of crops like the Currant, it lives but about a year and a half, and, like a multitude of other plants, perishes after maturing its seed, while its roots live on indefinitely. Like many of the herbs, the stems make a very rapid growth until they have attained their normal stature, when, in common with their branches, they terminate in a cluster of flowers, followed in due time by the fruit. Such would be the case, at all events, but for the fact that winter usually intervenes before the normal growth is completed, and destroys the terminal bud, leaving the future growth to be made by the axillary buds that have not yet started into vegetation.

This explanation should give us a clue to a rational method of pruning the Raspberry (and Blackberry as well), which has long been a sort of mystery to many growers of these delicious fruits. Why prune them at all? There are two



reasons, one of which has already been suggested. Winter comes on, at least in our climate, before the growth is completed, and usually destroys more or less of the immature and succulent terminal parts. It is better to remove this destroyed portion, because if left it continues to absorb and transmit by evaporation the sap brought up by the living part of the cane, thus robbing in a measure the fruit and foliage. This pruning

would naturally be done in the spring as soon as the buds begin to swell. Earlier than this it would be difficult to decide how much to remove; later, the dead portion would already have wrought a part of its mischief. The other reason for pruning is suggested chiefly, if not wholly, by the convenience of culture. The canes of the Black-Cap Raspberry (*Rubus occidentalis*) grow to such a

length as to greatly interfere with cultivating the plants and gathering the fruit unless they are dwarfed in some way by treatment. By permitting them to grow to their full length, and then cutting them back to a convenient stature, we should remove one-half or more of the fruit-buds, and thus materially reduce the crop. We must prune them in such a way that while we keep them down to a size that is convenient for working among them, we also preserve the flower-buds. To accomplish this we pinch the terminal shoot at the height of two to two and a half feet. This causes the buds in the axils of the leaves to develop into branches, and instead of a single cane six or eight feet in length we have half a dozen branches two feet or less long.

To the beginner it appears almost absurd to pinch a Raspberry-cane at the height of two feet. It seems as if the cane has but just commenced to grow, and that to pinch it at that height will prevent it growing taller. But it should be remembered that there are several nodes at the top of the stem that have not attained their full length, and which will continue to elongate for some days after the tip has been removed. A cane pinched at two feet will attain an ultimate height of three feet, which is sufficient.

It has often been recommended to pinch the branches when they have attained the length of a foot from the main cane. The wisdom of this is quite doubtful, at least in regions of severe winters. The effect of it is to cause axillary buds upon the branches to develop into shoots, and this will take place so late in the season that they have not time to make much growth, and, being immature, they are liable to kill back badly during winter. The result is that the buds that should have remained dormant until spring to furnish the flowers for the crop have been forced into growth in late summer, while the tender buds upon these immature shoots—all that are now left to furnish the crop—have either been killed outright or severely weakened by the winter. It is doubtless, in the majority of cases, better to let the branches from the main cane grow undisturbed until autumn and then cut them back as far as seems desirable at the spring pruning.

The canes of the Red Raspberry (*Rubus strigosus*) do not attain such great length as those of the Black-Cap type, and so do not, as a rule, need pinching in summer. When vigorous growing varieties like the Cuthbert are planted in rich soil the canes sometimes attain an inconvenient height. In such cases they may be pinched like those of the Black-Caps, but the pinching will tend to stimulate the growth of suckers, an evil which needs no encouragement, because it is apt to be excessive in rich soils even without the pinching. It would probably be wiser to substitute a weaker growing variety, or else to remove the plantation to poorer soil.

The reasons given for pruning the Black-Cap type of Raspberries will apply as well to the Blackberry.

University of Wisconsin, Madison.

E. S. Goff.

Disa grandiflora.

THE York nurseries have long been famed for the cultivation of this superb Orchid, which, when well grown, is very much superior to all other terrestrial species. It is, however, often a failure in English gardens, even when managed by growers of undoubted ability. The treatment which answers so admirably with Messrs. Backhouse, of York, appears simple and within the means of any one possessing a cold-house or frame. At a recent visit there I found over 1,000 spikes of the flowers of this *Disa* all in a house, or a portion of a house, some twenty yards long. Many of the spikes measured a yard in height, and five flowers on a spike were not infrequent. The house is a low span, running from north to south, with a central path and brick beds about four feet wide. The surface of the bed is about eighteen inches from the glass at the back, and is formed of sandy peat, with large pieces of soft sandstone scattered through it. The depth of the soil is about six inches, below which are clinkers and brick rubble. The best of peat is used, and the plants are always placed against a large piece of sandstone, an important point not to be overlooked. In this they soon establish themselves, sending out runners freely in all directions, so that if allowed to remain undisturbed for two or three years each plant becomes a many-headed tuft. The soil is kept moist, but not excessively so, injury resulting from too free watering even in the case of this plant, which in its South African haunts is often semi-aquatic. The house is shaded all day by a thin canvas blind, and the whole of the roof glass is drawn off both day and night in all favorable weather.

This is the whole secret so far as Messrs. Backhouse can reveal it. On the other hand, some cultivators grow this *Disa* well by planting it in a mixture of peat, sphagnum and brick

rubble or sand. But not even on Table Mountain is it possible to see a more glorious display of flowers than is produced annually in the famous York nurseries.

When we come to examine the plants we find considerable variety in the form and colors of the flowers far beyond anything described as occurring in nature. This variety in cultivated plants is accounted for by the fact that both in Messrs. Backhouse's hands and elsewhere in England seeds have been matured and large numbers of seedlings obtained from them. Sometimes it is possible to obtain strong flowering plants of this *Disa* in three years from seeds. According to Bolus, Trimmen, and others who have studied the habits of *D. grandiflora* at the Cape, wild plants are not known to mature seeds. Trimmen stated that he had never found any trace of insect agency in this plant, and Bolus, in his "Orchids of the Cape Peninsula" (1888), says, on this point, "I have never seen a matured seed vessel, nor been able to detect any insect employed in its fertilization. On its native mountains it has a wide range of altitude, grows vigorously in dense masses, or at least several together, being apparently propagated exclusively by the formation of new tubers, and isolated plants (such as might be expected if it seeded freely) are rarely to be seen. Considering the brilliant colors of the flowers these facts are remarkable, and seem to point to the extinction of the insect by which this species was originally fertilized." "Artificial fertilization and selection, although only comparatively recently applied to this species, have already produced remarkable results in the shape of variety. If this plant could be grown with the same ease and success everywhere as it is by Messrs. Backhouse we should probably in time get a race of varieties as diverse in character as Zonal Pelargoniums."

Kew.

W. W.

A Few Strong-growing Adiantums.—II.

A HANDSOME variety of *Adiantum trapeziforme* is known as Cultratum, and it bears some resemblance to the type, but has smaller pinnules. The young fronds, when developing, are brownish and sometimes tinted with pink, finally turning to dark green with shining black stipes, and frequently attaining a height of three feet or more. This peculiar shading of the young fronds is one characteristic which distinguishes this variety from *A. trapeziforme*, as the latter almost invariably comes up pale green in color. It may be said, however, that the tinting of the young foliage in Adiantums is not always a reliable characteristic to judge by, as differences in exposure as to light or shade may make some difference in the color of some varieties, though not in all.

A. digitatum is another fine species, and, like the preceding, is a native of Brazil and some other portions of South America. It throws up its light green fronds on slender footstalks from one and a half to two feet in height. The fronds are rather irregular in general outline, and are usually three times divided. *A. digitatum* grows best in a warm house temperature, and, as the fronds are rather brittle, it generally requires a few stakes to keep it in form. It is a very distinct species, having pinnules from half an inch to an inch in diameter, and when well grown makes a handsome specimen.

Still another fine Brazilian species is *A. intermedium*, also a stove species, and a notably good one, its massive-looking, dark green, bipinnate fronds, with somewhat woolly stipes, being both ornamental and useful, as they last well when cut and placed in water. While yet small, *A. intermedium* is a good species for window-ferneries, and, as the spores come up freely, it may be readily had for this purpose. This species has as synonyms *A. Brasiliense* and *A. triangulatum*.

A. Wilesianum is a very handsome species from Jamaica, and it is not very common, probably from the fact that it does not produce so many spores as some other species, and the propagation of it thus depends in a measure on division of the crowns. *A. Wilesianum* is somewhat similar in general appearance to *A. cardiochlena*, though abundantly distinct from the latter. It bears broad fronds that are two feet or more in height and pale green in color. The fronds have shining black stipes which stand up well without support and form an admirable contrast to the delicate coloring of the pinnæ. This species will also be found to grow best in a temperature of about sixty degrees.

A. tetraphyllum gracile is another effective species, the fronds averaging from one to one and a half feet. The young fronds of this species are specially attractive, being bright pink in color, which gradually fades as the frond attains its growth, when it becomes dark green. The fronds of this variety are easily injured by excessive dampness, and it is best therefore to keep the water off the foliage as much as possible, though an abundant supply at the root is necessary. This species,

like so many of the finest of the Maiden-hairs, is of South American origin, being found in Colombia.

A. Aneitense is a fine addition to the genus, made within a few years. It is evergreen, of free and rapid growth, and soon becomes a shapely specimen. Its fronds have some resemblance to those of *A. fulvum*, but are stiffer and harder, and more lasting when cut. This species seeds very freely and the spores germinate quickly, so that it is as easily multiplied as the ever popular *A. cuneatum*. *A. Aneitense* averages about eighteen inches to two feet in height and thrives in a temperature of fifty degrees.

A. curvatum should not be omitted in any good collection, though it has not an excellent reputation for free growth, being often considered difficult to manage. The fronds are large, tripinnate, and very bright green in color, with stipes more or less hairy, the pinnules being curved back to such a degree as to give them almost a sickle shape. This is a stove species and requires heavy shading to encourage its growth, and the soil I have found most satisfactory for it is nothing but rough, fibrous peat, broken into lumps that may be only limited in size by the pot to be used. With this soil and abundant drainage material in the bottom of the pot or pan I have always secured fine plants.

Perhaps it should be said that the *Adiantums* of more delicate habit have been omitted from these notes, not from any lack of appreciation, but simply because this arbitrary classification is convenient.

Holmesburg, Pa.

W. H. Taplin.

Cattleya Warneri is one of the best of summer-flowering varieties. Its relation to the Labiate section can easily be perceived in growth and habit. The flowers are large, most of them measuring seven inches in diameter, and the lip is from two to two and a half inches across. The sepals and petals are of a most beautiful rose color, the best varieties having a rich magenta-crimson lip, very finely fringed. We have a few plants with such a lip, but the greater portion of them vary much, both in color and form. In the many plants we have there are very few with a lip of the same shade, every variety being distinct. The durability of the flowers is surprising, some lasting five weeks in perfection. We have had a display of this most magnificent *Cattleya* for ten weeks, the last flower having just faded.

We grow it in glazed pans about five inches deep and made with holes dotted here and there in them. The glazing seems to help the plants in many respects; for instance, they need no washing, and therefore the roots never get damaged from this process, and they always keep sweet and clean. We fill them within an inch of the top with potsherds, and cover these with a layer of moss; then the plant is firmly potted in a compost of fibre and sphagnum moss and charcoal, taking care to have it well up above the top of the pan.

We never allow our plants to remain dry for any great length of time, as they make their growth in winter and an abundance of roots in summer. They are suspended from the roof, where they get all the light possible, and at all times, except when in flower, when they are put in a more shady place to preserve the flowers as long as possible.

These plants never fail to flower with this treatment, and most of the spikes carry three and four flowers.

Staatsburgh-on-Hudson.

F. Atkins.

Cytisus scoparius Andreanus.—This beautiful new variety of the common Broom received a first-class certificate of merit at a recent exhibition of the Royal Horticultural Society. I recently saw the plant in bloom at the nurseries of Messrs. Temple & Beard, at Cambridge, and it certainly deserves this honor. In habit the plant resembles the common Broom, to which Linnæus is said to have rendered homage on first seeing it in bloom. In the typical plant the blossoms are clear bright yellow, but in this variety the lower part of the flowers are of a rich crimson-brown, which gives it a very distinct appearance when in bloom. It is said to have been found some five years ago in Normandy, and it has proved perfectly hardy in English gardens, where the typical plant and a white-flowered variety are often cultivated for their beauty as garden shrubs. *Cytisus scoparius* has been found to be perfectly hardy in New Jersey, and this being so, we may reasonably hope that André's variety will eventually be added to the list of beautiful plants for New England gardens; and the list will never be too long to admit novelties of such merit as this one possesses.

Achillea serrata plena.—The old *Achillea ptarmica* has long been valued in gardens for its pretty clusters of double white flowers, and florists often cultivate it on account of the dura-

bility of the flowers when cut; but the introduction of the double *Achillea serrata* will almost certainly result in the discarding of *A. ptarmica*. This latter has smaller flowers, and fewer of them, and is of a sprawling habit. A shower of rain bespatters the flowers with mud and renders them useless. *Achillea serrata* grows fully four feet high, and fully three feet of the stem produces useful side branches, with terminal heads of pure white, very double flowers, fully twice the size of those on the older plant. The quantity produced on the stems renders them top-heavy, and a stake is necessary to keep them erect. We have been cutting for the past month from this plant, and shall continue to do so for a week or two more, so that it can be easily seen that the plants hold out well, even in dry weather such as we have recently experienced. It may not be generally known that these *Achilleas* are readily propagated from the underground shoots or stolons. After flowering in fall the plants may be lifted and placed in soil until January, when the stolons may be taken off, curled around in three-inch pots and covered with soil; they will commence to grow at once, making strong plants for the garden in April, and will flower abundantly during summer. When these double *Achilleas* get old it is always best to take them up and raise young stock. This treatment will always pay for the trouble involved.

South Lancaster, Mass.

E. O. Orpet.

Dianthus semperflorens Marguerite.—This interesting Carnation, first offered in seeds and plants this season, is a new strain of Remontants originated by M. Boncharlet Jenne, the well known French horticulturist. Seldom does a floral novelty so fully bear out the claims made for it, for this proves to be a valuable race, with remarkably good points. The plants are rapid, vigorous growers, with good foliage and good habit, of medium height, and may readily be had in bloom in between four and five months from seed. The flowers are of fair size (sometimes of thin texture), often well fringed and fragrant. The seeds are said to produce ninety per cent. of double flowers, but no single ones have appeared among my plants. My flowers are very double, scarlet and rose. It is said there are pure white and striped ones in the race. The plants have every appearance of being of a "perpetual," free-flowering character, though it is not, of course, possible to report on this without further experience. It is scarcely necessary to say that such a race of Carnations is a great gain, enabling every one to readily secure a supply of most valuable flowers for the summer decoration of the garden. The usual "florists' varieties" of Remontants seem to be of not much value for garden purposes, as commercial growers have naturally given their attention to those most serviceable for blooming under glass and producing long stems.

Elizabeth, N. J.

G.

The Forest.

The Sihlwald.—III.

BEGINNING in rights of usage rather undefined until the opening of the fourteenth century, the rights of property of the free City of Zurich in the Sihlwald extended in 1309 to complete ownership in the forest, and have since been disputed only at the time when, following upon the events of 1798, the free city changed its government to that of a municipality under the confederation. But the rights of the municipality of Zurich in the Sihlwald were definitely confirmed by the so-called Mediation Act of 1803, and the possession of the forest was assured to the city which had so long enjoyed it. Evidences of the care which the burghers bestowed upon it are found in the series of ordinances which, beginning in 1309 with a rule that no forester might cut wood in the Sihlwald—clear proof that a forest-police existed at that early date—continued in unbroken succession to that of 1417, under which the foundation of the present organization was laid, and finally, in 1697, reached the first technical working-plan. It is curious to note as an indication of the view of the nature of its interest in the forest held by the city, that the policy of adding to the public forest-property by purchase, recently inaugurated by the Legislature of the State of New York, was begun by the free City of Zurich nearly two centuries before the discovery of America. It is true, however, that the property has been diminished at times through sales and especially through grants of land for the extinction of servitudes; but the purchase of over four hundred acres during the last fifty years leaves no doubt of the tenacity with which Zurich holds to its forest-inheritance.

The administration of this historical bit of woodland is subject, in common with that of the forests of communes, public

institutions and corporations and private forests necessary for protection, to inspection by the forest-officers of the Canton and the Confederation. Its chief, Forstmeister Ulrich Meister, who holds his office directly from the city, is at the head of a staff which comprises, besides a first assistant with the rank of Oberförster and a variable number of young men who are completing, under his orders, their year of practical work, four trained foresters and a permanent force large enough to carry on the whole lumbering, manufacturing and administrative work of the Sihlwald. And herein lies the chief reason why such an amount of delicate work in the way of silvicultural operations is so cheaply and excellently done. Every wood-chopper in the forest is familiar with the methods of planting and thinning as well as the manner of felling required to ensure the best results, and work which is thought in France to demand the presence of a forest-inspector is here successfully executed by common laborers under the somewhat loose supervision of a forester of the lowest grade.

The financial management, on the other hand, whose avowed object, unlike that of the Forest Administration of the French Government, is to produce the greatest net return in money and not in material, is rigorously centralized and exact. Monthly balances and reports of stock, submitted to Herr Meister and the central office at Zurich and compiled into an annual document at the end of each year, make it easy for the Forstmeister to control the affairs of his forest. Economy as strict and watchful as that of any private enterprise prevails wherever it is consistent with the best interests of the forest; but when its welfare and completeness or the attainment of a scientific silvicultural result is at stake, a wise and open-handed liberality appears. Under this management the Sihlwald gave last year a net return of something over \$8 per acre, or a total contribution to the treasury of the city of about \$20,000. This sum, large as it is in relation to the area of forest which produced it, promises to be materially increased by the Sihl Valley Railroad, whose construction in the near future will unquestionably enrich the whole valley through which it is to pass. It is not known to me what proportion of this amount, resulting as it does from the sale of fuel and manufactured wood, is derived from the mills as distinct from the forest; but undoubtedly their contribution is of importance. The centre of their activity is, of course, the saw-mill, where ten of the sixty horse-powers, which a turbine takes from the Sihl, go to drive a hand-saw, whose cut, of perfect smoothness and accuracy, is adjustable to the twenty-fifth of an inch and lies in a horizontal plane. The remainder of the power is consumed in the handle factory, whose principal machinery is American, a series of Excelsior machines, circular saws for various purposes, and four extremely simple contrivances for splitting the smaller kinds of firewood. Blacksmiths' and wagon shops—the Sihlwald manufactures nearly everything it uses—and a Boucherie apparatus, for the injection of wood with a solution of copper sulphate by hydrostatic pressure, complete the list. So successful has the injection plant been that telegraph poles, given by its means twice or three times the life they would have had without it, have been exported as far as Rome, and railroad ties, wood pavement, shingles, vine props and a variety of other articles prepared in the same way, have made a very handsome return to the management that was bold enough to undertake their manufacture.

The annual yield of wood, almost half of which is from thinnings alone, reached last year 377,023 cubic feet, an amount which may be taken as slightly above the average. The proportion of fire-wood is generally seventy-four per cent., yielding, however, but sixty-four per cent. of the total revenue. Wages, according to Herr Meister's admirable treatise on the Sihlwald, published in 1883, were at that time at the rate of a little more than half a cent per cubic foot for felling logs, and one dollar and nine cents per cord felled, split and stacked. This represents only from fifty to seventy cents a day; yet the workmen are happy and prosperous, as the statistics of the savings bank and mutual relief fund established among them by Herr Meister go far to show.

With an average stock per acre of 2,860 cubic feet, and the land estimated at \$140, the capital value of the Sihlwald is variously stated and decidedly hard to get at. Herr Meister's estimate, given to me last spring, was \$500,000. A calculation based on an assumed rate of interest of four per cent. makes it \$320,000, whereas three or even two and a half per cent. on investments is here often regarded as sufficient. Exact figures are not obtainable, from the nature of the case.

But the interest of the citizens of Zurich in the Sihlwald is far from being wholly centred in the substantial return which it makes to the city treasury. Their second interest lies in the qualities of a great city park, which it unquestionably pre-

sents. It has been the wise policy of Herr Meister to maintain throughout the forest a net-work of well-kept roads and paths, to place occasional benches along them, to keep the beauty of the landscape unharmed, and in general to make the Sihlwald thoroughly and pleasantly accessible. In so doing he has secured its future by demonstrating to the people the reality and value of their ownership.

The question naturally arises whether the multiform advantages to be derived from such a city forest in Switzerland might not be enjoyed in America. The factors which it involves cover too much ground to admit of discussion here, but this much may be briefly said: Were such a forest once in the possession of one of our cities it would not only afford a place of resort whose peaceful freedom would exceed in restful quality all that our present parks can give, but it would combine, under proper management, a steadily increasing revenue to the city, with an educational force and value such as, in the present state of forestry in America, would be amply sufficient to justify its existence. The value of the Sihlwald to the City of Zurich is great and unquestioned, but whether the system might be advantageously transplanted to America, local circumstances must go far to decide.

Nancy, France.

Gifford Pinchot.

Correspondence.

The Evils of Grafting.

To the Editor of GARDEN AND FOREST:

Sir.—Your correspondent, Mr. S. B. Parsons (see page 350), is not quite so logical as usual in his replies to Mr. William Robinson's questions on the above subject. For example, Mr. Parsons tells us that "no intelligent or conscientious nurseryman will think, under ordinary conditions, of grafting a cion upon stock which suckers, or upon stock which is not closely related to it," and yet he fully bears out in his replies to the questions asked the statements that such errors are committed by nurserymen time after time. Mr. Robinson's American Weeping Willows and his dwarf *Pyracanthas* had both been grafted by nurserymen on coarse-growing stocks, both of which suckered badly, and the Quince stock used in the case of the *Pyracantha* could scarcely be said to be closely related to the cion. Again, we find even Mr. Parsons himself recording his testimony against grafting or budding, not only in the above two cases, but against the working or budding of Roses, which he does in these pregnant words: "I can see no reason why plants which take root readily from cuttings should be increased by grafting, and I yesterday found myself very impatiently rooting out some Tea Roses which I had imported from England, and which were budded and overgrown by the stock." The fact is that three-fourths of the direct evidence given by Mr. Parsons on page 350 is in perfect agreement with the opinions expressed by Mr. Robinson and held by myself.

Mr. Parsons says that my strictures upon and against grafting may be taken as "a reflection upon a large body of respectable men." I, in writing, like to state a case as definitely as possible, and the aphorism that "grafting is always a makeshift, and very often a fraud," is fully corroborated by Mr. Parsons having to root out his Tea Roses, and also by Mr. Robinson's difficulty with two hardy shrubs, Willow and Firethorn, respecting both of which Mr. Parsons thinks as we do, that they should not be grafted at all!

The fact is there has arisen a tendency to graft everything, as if there were some occult advantage in the mere operation of effecting a more or less perfect union. The old notion that a strong-growing or a vigorous-rooted stock would add strength and vigor to a weakly cion is utterly exploded by modern physiology. The converse of this—namely, the grafting of a vigorous cion upon a more slow-growing, weakly or restrictive stock—may in certain cases conduce to precocious fruiting, but certainly the same result could be more readily obtained by other and more simple cultural methods. An English gardener who visited Florida lately tells us that the grafted Orange-trees there fruit earlier than the seedling-trees, but that the latter are immeasurably superior in health, fertility and longevity. Dr. Wallace, in his chapter on "Acclimatization," in his latest work, "Darwinism," says that the eastern Orange-trees as introduced to Italy and increased by grafting, continued tender and unsatisfactory until the practice of rearing seedlings began. Again, even our greatest English experimenter and cultivator of fruit-trees, Thomas Andrew Knight, began to doubt the efficacy of grafting toward the end of his career.

I still believe that a vast amount of harm has been done to gardening by the fatal facility of grafting plants which, as Mr. Parsons himself shows, could be better and often cheaper

increased by other and more simple methods. It is not a question of what is easiest or cheapest to the nurseryman, but what is best from the general cultivator's point of view.

Grafting, even although it sometimes does afford facilities of increase, also acts indirectly in the very opposite way. For example, if a choice shrub or a fine fruit-tree is worked on a common stock, then the suckers are a source of trouble and loss, but were these desirable plants on their own roots suckers would become a gain. In a word, a plant grafted on a stock standard or half standard high becomes exceedingly difficult of increase except by grafting! This is a point worth bearing in mind in connection with this question, and looking at grafting from all points of view, I am convinced that we should have had better fruit-trees and better and healthier and more prolific varieties in our gardens to-day had grafting never been invented.

As to the delicacy of the Ribston Pippin Apple, I believe I am correct in saying that a sucker of the original seedling tree is still alive in the British garden in which it appeared a century or two ago. When Mr. Parsons talks of "inherent weakness of constitution" as a possibility in this case, it may be so or it may not. To find out if this delicacy and liability to canker is "inherent" or caused by unsuitable stocks, or grafting, Mr. Robinson has gone back to first principles, and has now a healthy little plantation of Ribston Pippins on their own roots, and I think every nurseryman more especially should experiment also in this direction, and while they keep on grafting stock, give the purchaser at least a chance of seeing with his own eyes a few specimens ungrafted. If I write and order a rare shrub or tree ungrafted and it is sent grafted on something else I submit I have a right to return it, just as I have to return a grocer coffee mixed with chicory, when I had expressly ordered pure coffee.

I have frankly stated my opinions on grafting after having seen and experienced a good many of its evils, and I am glad to know that my remarks have led to more careful methods of observation on this and kindred subjects on the part of amateurs and practical gardeners. This is a great gain since the old times when grafting was considered to be an unmixed blessing, and I hope that your Horticultural Experimental Stations in America will take up the subject and carry it further than any individual can possibly do.

In conclusion, I should like to allude to the seedling Apple-trees mentioned by Mr. Parsons as having sprung up over the older settled parts of your country. A glance at Downing's work will show how many of these are now established varieties, indeed most of your best fruits are different from ours. I presume the three Apple-trees mentioned by you on p. 352 are all seedling trees. The context seems to show that the first is so and the last and largest tree, in Washington County, is absolutely stated to be a seedling planted in 1791 or 1792. The trunk where it is smallest girths twelve feet two inches, and the largest branch girths seven feet. I should like to hear of a grafted Apple-tree a century old and of these dimensions.

Botanical Gardens, Trinity College, Dublin.

F. W. Burbidge.

[American nurserymen are aware that evils result from grafting when it is practiced without judgment, but they do not therefore condemn all grafting; nor will they believe that it is "always a makeshift." Indeed, it has been shown in these columns that grafting serves many useful purposes which cannot be attained so effectively by any other known method. Perhaps more seedling Apple-trees are grown in the United States for the purpose of obtaining new varieties than in all the rest of the world, but Mr. Burbidge does not need to be reminded that these varieties cannot be perpetuated by seed.—Ed.]

Periodical Literature.

IN the August number of *The Forum* is an article on "The Possibilities of Agriculture," by Prince Kropotkin, in which he attempts to show the fallacy of Malthus' theory that as population increases the new comers will find no room at the feast of Nature. It is hardly worth while to speculate as to what humanity will do when it begins to feel overcrowded, since that question is so remote that its decision may be left to our descendants. But it may not be out of place to give some of the examples which are used to illustrate the possible increase in the productive power of the earth under intensive methods. Thirty years ago twenty-two bushels of wheat to the acre was considered a fair crop in France, while the present average is, at least, thirty-three bushels on the same land,

and in the best soils the crop is considered good only when it yields from forty-three to forty-eight bushels, and occasionally as much as fifty-five and a half bushels to the acre. Experimental farms in central France produce annually over large areas forty-one bushels to the acre, and there are farms in northern France which yield year after year from sixty-five to sixty-eight bushels to the acre, and as much as eighty bushels have been obtained upon limited areas under special care.

At Whitley, England, from 77 to 110 tons of Beets have been grown on an acre, and in France for fourteen consecutive years, on the same lot of land, forty tons of fodder for ensilage—that is, the food of four cows at least—is obtained from an acre. It is somewhat rashly assumed, too, that Mr. Hallett, by a simple selection of grains, will soon obtain a wheat which will yield the yearly supply of bread for a full grown person on a score of square yards! Under high cultivation two and a half tons of hay in Flanders has been considered a fair crop, but when irrigated with pure water these meadows yield three or four times as much—that is, a money return of from \$120 to \$280 an acre is obtained from soil which formerly yielded only from \$16 to \$48 worth of poor hay; while below Milan the nearly 22,000 acres irrigated with water from the city sewers yield crops of from eight to ten tons of hay as a rule, while occasionally some separate meadow will yield the enormous amount of eighteen tons of hay to the acre—that is, the food of more than three cows for a year.

Proceeding to examples in horticulture it is stated that the Paris market-gardeners are able to pay \$126 rent to the acre and make a good living. What attracts market-gardening to the vicinity of great cities is the stable manure, and the value of this is not so much due to the richness which it adds to the soil as to the increased temperature which it supplies by fermentation. Early vegetables pay best and the soil as well as the air must be warm. But it is plain that this warmth can be obtained more easily by pipe-heating, so that a few years ago the Paris gardeners began to heat the soil by means of portable hot-water pipes. It is also stated here that the original fertility of the soil is of little consequence to the best gardeners, since the soil is always actually made, so that it is now a usual stipulation in the renting contracts that the gardener may carry away his soil, and when he moves to another plot he carries it away with his frames and water pipes and other belongings.

The Island of Jersey is a land of open-field culture, and yet it nourishes a population of two inhabitants to each acre and the early Potato crop returns more than \$300 to each acre planted. Besides this, cereals and grass are grown for cattle, and more than one cow is supported on each acre of grass-land. In addition to the enormous amount of dairy products exported, 1,500 milch cows a year are sent away, so that an agricultural produce to the amount of \$250 an acre of the entire surface of the island, including the rocks, is obtained.

The Island of Guernsey nourishes 1,300 souls to each square mile of soil, which is less productive than that of Jersey, but the land is given over to market-gardening and greenhouse culture. These greenhouses are seen all over the fields and on the steep slopes of the hills, the origin of this new departure being the production of grapes, which was started some thirty years ago. Five hundred tons of grapes are annually exported now, and yet the most important crops under glass are ordinary vegetables like Tomatoes, Potatoes, Carrots, etc. Three-fourths of an acre under glass and heated for three months in the spring yields some eight tons of Tomatoes and 200 pounds of Beans as a first crop in April and May, to be followed by two crops more in summer and autumn. In simple glass and plank shelters Pea plants cover walls in places for a length of a quarter of a mile and potatoes are dug in April at the rate of five bushels to twenty-one feet square.

Mr. Bashford, in the Island of Jersey, has vineries which cover thirteen acres, and the money returns from them greatly exceed those of an ordinary English farm of 1,300 acres. The last year's crops were twenty-five tons of grapes, eighty tons of tomatoes, thirty tons of potatoes, six tons of beans, (the last three April-crops), to say nothing of subsidiary ones. The cost of the houses is only \$2.34 to the square yard without taking into account the pipes, and all the work is done by thirty-six men. A thousand loads of coke and coal are all the fuel that is required. Besides these well constructed greenhouses, simple shelters which cost only ten cents a square foot often help to raise surprising crops ready for sale by the end of April. Altogether the glass house is no longer a luxury, and grapes will soon cost in England no more than the few pence they cost on the Rhine, because the labor in growing grapes in Northumberland, where a ton of coal costs but three shillings at the mouth of the pit, is much less than the

work which has to be done in carrying the soil up the cliffs of the Rhine to the height of several hundred feet and in attending to the vines there.

Prince Kropotkin gives no forecast as to the possible productive power of the earth when organic manures—that is, special liquids containing special microbes—are used in addition to chemical manures, and when science has discovered some economical way of obtaining nitrogenous fertilizers from the limitless supply of nitrogen in the atmosphere which surrounds the earth. But he makes a suggestion to American readers which it is worth while to reproduce:

"Suppose that instead of building at the Chicago Exhibition an Eiffel tower 1,000 feet high, a number of intelligent men should cover with glass houses, say, a hundred acres or more. Suppose they devote forty acres to art—I mean to flowers and to tropical vegetation—and the remaining sixty acres to the plainest vegetables and fruits, such as will be consumed by the ton during the exhibition. It will not cost one-tenth part of what the tower would cost, but it is sure to repay the expense. And—what is infinitely more important—it will make a complete revolution in the ideas of mankind as to what the soil is, and how it must be treated. It will stimulate invention in a field where it is most required; and it will be a new departure for the coming century."

Notes.

We have received from Messrs. Siebrecht & Wadley a flower of *Gloxinia* which is pure white, with no color-markings whatever. It is from one of their seedling plants and it seems to have great substance.

The annual *Gladiolus* show at the stores of Peter Henderson & Co. is now in progress and it is quite as interesting as it has been in former years. Besides the *Gladiolus* there is a varied display of French Cannas, Lilies and other summer blooming plants, with fancy *Caladiums*, Ferns and a large collection of well grown Palms. A tank full of choice aquatics seems to be the principal attraction for many of the visitors. The exhibition will remain open through Friday.

In the forest behind the Castle of Mereworth, Maidstone, stands a Beech-tree whose age must be more than 250 years, and which shows no indications of decay. The bole at three feet from the ground measures seventeen feet in circumference, and it only commences to branch at a height of twenty-two feet. The diameter of the crown is thirty yards. Dates cut in the bark about the middle of the last century, still clear and easily deciphered, show that it was a big tree then, and that it has expanded but little since.

An old periodical says of the poet Wordsworth: "He is fond of the Hollyhock, a partiality scarcely deserved by the flower, but which marks the simplicity of his tastes. He had made a long avenue of them of all colors, from the crimson-brown to rose, straw color and white, and pleased himself with having made proselytes to a liking for them among his neighbors." This was long before the days of the "æsthete" and his love for stiff "decorative" flowers. To-day a Hollyhock would not be called undeserving even of a poet's preference.

The *Gardeners' Chronicle*, in speaking of some flowers of *Fuchsia triphylla* which had been received from Mr. W. Dean, adds, "This old species, remarkable for its compact bushy habit, dark foliage, claret colored on the under surface, and its terminal racemes of orange-scarlet flowers, would make a good market plant. Cuttings struck last autumn, and grown on in an intermediate house in ordinary potting mould, are now flowering freely in the Birmingham Botanic Garden." In a recent description of these Birmingham Gardens in this journal it was stated that this plant there formed perfect specimens two feet through, and completely covered with clusters of long-tubed flowers. Since this *Fuchsia* was rediscovered by Mr. Thomas Hogg as long ago as 1873, it seems to have been slow in securing the attention it deserves.

In his article on the Yosemite, in the August number of *The Century*, John Muir speaks of the forest of Big Trees in Tulare County, which Secretary Noble has been asked to save from destruction: "But the finest block of *Sequoia* in the entire belt is on the north fork of the Tule River. In the northern group there are comparatively few young trees or saplings. But here for every old, storm-stricken giant there is one or more in all the glory of prime, and for each of these there are many young trees and crowds of eager, hopeful saplings growing heartily everywhere—on moraines, along water-courses and in the deep alluvium of meadows—seemingly in

hot pursuit of eternal life." That is, this is a true forest, with all the elements of continuous forest-life, and not merely a collection of ancient trees with no hope of a succession.

To illustrate the way in which we waste our forest-resources, Mr. Fernow writes in *Kate Field's Washington*: The poor state of Prussia, with a population nearly twelve times as dense as ours, must husband her resources closely to supply her wants. A first-class forest-administration is therefore among her institutions; and from its carefully collected experience we learn that forty-one cubic feet per acre per year is all the wood crop she can raise. Of this, forty per cent. is brush and such inferior-sized wood as no American would use. We may, then, accept an annual production of twenty-four cubic feet of wood per acre, over our whole forest-domain, as a reasonably large average figure. That is to say, there would grow only twelve billion feet, where we cut twenty billion, and eat into our forest-capital at the rate of eight billion feet yearly. Thus in progressive ratio are we despoiling our children's heritage.

The announcement of the death of John Ralfs at Penzance, England, on July 14th, at the advanced age of eighty-three, recalls the life and work of one who was formerly prominent in the botanical world, although it is now many years since he published anything on botany. His profession was that of medicine, and in his early days he practiced at Shoreditch. In 1839 he published a treatise on British Flowering Plants and Ferns; but his principal studies were on Desmids and Diatoms, and other low forms of Algæ, and in this field he was a recognized authority. He was the author of a considerable number of papers, especially on Desmids, most of which appeared in the *Annals and Magazine of Natural History*; but the work on which his fame now rests is "The British Desmidiæ," beautifully illustrated by Edward Jenner, which was published in 1848. This excellent work will always remain a classic on the subject. It is especially important to students of North American Desmids, since it includes the descriptions and figures of a considerable number of species collected by the late Professor J. W. Bailey, of West Point, by whom material was sent to Ralfs.

Experiments to test the relative value of steam and hot water for heating were conducted last winter at the Agricultural College of Michigan, and the tests indicate that for small green-houses hot water is more economical and more satisfactory than steam. In the month of December the steam-house had an average temperature one and a half degrees lower than that of the hot-water-house, although five tons of coal were consumed in the former as often as four tons were consumed in the latter. Maximum and minimum thermometers also indicated a greater variation of temperature in the steam-house than in the other. The records for other months were similar. During the month of April the two systems were compared in a different manner. The same amounts of coal were supplied to each house, and the result was that the hot-water-house was kept at a temperature seven degrees higher than that of the steam-heated house. Of course it cannot be proved that the most effective system of utilizing steam heat was used, and another kind of heater might reverse these results. But, on the other hand, it may be said that this test only corroborates the experiments made by Professor Maynard at Amherst.

Every reader of English novels knows of the "pot-pourri" made from rose-leaves which old ladies keep in china jars to perfume their drawing-rooms. The following recipe, recently given in the *Detroit Tribune*, may therefore be of interest: "Gather the roses in dry weather, remove the petals, and to a peck of fresh leaves add a good handful of salt. Let this remain five days, stirring up the leaves every day. When they appear moist add three ounces of bruised allspice and one ounce of cinnamon stick bruised. After this stands for a week, stirred daily from the bottom, put into a permanent jar one ounce of allspice, and add the stock layer by layer. Sprinkle between these layers one ounce each of cloves and cinnamon, two nutmegs, all coarsely powdered, some ginger-root sliced thin, half an ounce of anise-seed bruised, ten grains of fine musk, half a pound of freshly dried lavender flowers, two ounces of powdered orris-root and *ad libitum* cologne, rose or orange flower water, orange or lemon peel. Freshly dried violets, tuberose, clove pinks, or any other scented flowers may be added. Fine extract of any kind will enhance the fragrant odor, while fresh rose leaves, salt and allspice, made as at first, may be added when convenient. Stir the jar occasionally, leaving it closed except when the perfume is wished to odorize the room." Thin bags filled with this "pot-pourri" and placed in bureau drawers or linen presses impart a delightful fragrance to their contents.

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City Improvement Societies.

ONLY a few years have passed since the first Village Improvement Society was organized, but scores of these associations are now doing good work in every part of the country in securing for rural communities more favorable sanitary conditions, improving roads and path-ways, beautifying public squares and the grounds about public buildings, educating the public taste, and in many other ways making country life more attractive and sat- isfying. There would seem to be little need for similar asso- ciations in cities where the government is more directly charged with the duties which these societies have assumed. There is a Board of Public Health to look after the city's drainage and general cleanliness. There are Park Com- missioners charged with the supervision of its public grounds. There is a Board of Works to look after the high- ways, and in many cases the planting of trees; and yet there is little question that an active association in every city which should charge itself in a general way with functions similar to those performed by the Rural Improve- ment Societies would help to supplement official action by directing it in proper channels and making it more effective. Organization is always effective by uniting the desultory efforts of individuals; and that much good can be achieved in the speciel direction indicated is proved by the effective work of the Metropolitan Gardens Association of London, the City Parks Association of Philadelphia and the Tree Planting and Fountain Society of Brooklyn.

A report of this last-named organization has just been received, and from it we learn that of the 70,000 trees now standing in the streets of Brooklyn a considerable portion have been planted under the auspices and at the sugges- tion of this Society. After it was formed, some eight years ago, many public meetings were held, circulars were issued, and articles calling the attention of citizens to the value of trees in city streets were published in the daily papers. But the work was carried on in still more practical ways. Various nurserymen were asked to fur- nish information as to the number of trees they had in stock of different varieties and the prices at which they could be obtained. As the time for planting approached

the Society secured a storehouse in which samples of trees from various nurseries were kept on exhibition, and suit- able persons were always in attendance to give informa- tion as to the proper methods of planting, the varieties most useful and the places where they could be obtained at the most favorable prices. When it was desired, the Society not only furnished trees at cost price, but sent skilled men to plant them and charged for the special ser- vice only the amount that they had paid for the labor. After the trees were planted instructions were given as to their care; devices for protecting them from horses and other dangers were explained, and efforts were made to create a feeling that the city trees were common property and that every citizen had a personal interest in preserving them. In order to properly educate the young, this Society urged the Legislature to pass an act for the encouragement of arboriculture, and this resulted in the appointment of an Arbor Day for the state, and in its celebration public exercises are conducted by the various school officers throughout the state and participated in by all the children of the public schools. Of course, this general work is but a small portion of what the Society is constantly doing. As an example of its special watchfulness, it may be stated that when some of the trees, notably the Maples, in the city were suffering from the ravages of an insect, a com- petent entomologist was called in to make a study of the cause and to report upon the best means for overcoming this evil.

Altogether there is no good reason why associations of this sort could not be made as helpful in the city as in the country. Without naming all the directions in which their influence could be exercised for good, it may be worth while to indicate one in particular, and that is in protecting public parks. It is not always, perhaps it is not generally, true that commissioners of city parks have any adequate appreciation of their true function. They cannot be trusted to repel the attacks constantly made on the parks; they often side with the assailants and organize attacks of their own. In this city, for example, it is constantly happening that city officials who would hardly assume to make plans for a monumental public building consider themselves per- fectly competent to design an urban park or change the design of one already made. It has never dawned upon them that one of these works is or ought to be as truly a work of art as the other. Only a few days ago the Mayor of this city suggested in an off-hand way, and yet in his official capacity, that the entire system of walks and drives in Central Park should be remodeled. He was troubled by no doubt that his plan would be infinitely superior to the original one, or that he was perfectly qual- ified to direct such an undertaking. Similar attacks upon the integrity of our parks, efforts to pervert them from their highest use, and even attempts to obliterate them or to confiscate them to some alien use, are happening every year. Central Park has been saved as by fire, simply be- cause there has been intelligent opposition to its destruc- tion made in a few newspapers. These assaults will probably grow more frequent and more urgent as popu- lation presses about it more densly, and the time may come when a well-organized defense will be needed to keep its woods and meadows from being utterly trampled out or covered with brick and stone. A voluntary association which would, in addition to other duties, devote intelligent attention to the preservation and proper management of parks could find an ample field for labor in every consid- erable city of the Union.

Just a year ago we published a letter from Mr. Charles H. Shinn (vol. ii., p. 398), in which it was stated that Colonel J. B. Armstrong proposed to dedicate 400 acres of magnifi- cent Redwood forest to public use forever. It was there said that this piece of primeval wood was of almost unique value, since it has never been touched by the axe nor has it been pastured. It shows the growth of the Redwood in every type; in single trees, in clumps of twos, threes, fours

and so on up to family circles of ten or twelve about the roots of some giant of an earlier generation. The very side-sprouts, which grow up from the base of these Redwoods, are as large here as timber-trees in other countries. One of the trees which Mr. Shinn measured was forty-seven feet in circumference and 325 feet high.

From a late number of the *Cloverdale Reveille* we learn that Colonel Armstrong has decided not to present the state with this tract of Redwood, nor does he intend to give it to any particular municipality, but to trustees, for the use of the people for all time. The Board will be constituted perhaps as follows: The Chairman of the Board of Trustees of the Golden Gate Park of San Francisco, the landscape-gardener of Central Park, the Chief Justice of the Supreme Court of California and a local trustee in the county. These gentlemen will have the power of appointing their successors, and they will be hampered by few restrictions in the deed of trust. One condition will be that none of the timber is to be cut. Another is that the park shall not be a place of encampment, for fear of fire, and that it shall only be visited by daylight. This magnificent tract lies in Sonoma County, and is accessible by rail from San Francisco, which is only seventy miles distant, and it is the last considerable tract of Redwood in this region or so near the city. Of course the forest is not exclusively Redwood, for these trees are mixed with Laurels and Oaks, sometimes in a compact wood and again in open order, with occasional grassy openings.

It is probable that this report is incorrect in one particular, and that is in regard to arrangements which are said to be in preparation for propagating strange plants, flowers and shrubs to be used in bordering the drives and otherwise ornamenting the giant grove. No doubt Colonel Armstrong appreciates his forest so thoroughly that he will not think of improving it by tricking it out with any exotic finery. He means to preserve it for posterity as a Redwood forest and he will hardly allow its grand expression to be trifled with by any attempts at decoration.

A Fine Bur Oak.

WE published last year (ii., 500) an illustration showing the stem of a remarkably fine specimen of this tree grown on the rich alluvial lands bordering the river-bottoms of southern Indiana, where this species attains its greatest height and girth of stem. This particular specimen had grown in the midst of the forest, thickly encompassed by other trees which had forced an upright development of stem and prevented the great spread of branches characteristic of this and other species of the Oak when these trees find the room and light essential for the full growth of their lateral branches. Wide-spreading Oaks are never met with in the dense forest, although they abound in the north-west in the region which separates the heavy forests of the eastern part of the country from the midcontinental prairies. These intermediate regions, covered with an open growth of Oak-trees, are called Oak-openings. The sparseness of the timber and the prevalence of Oaks, which resist better than most other trees the effects of constant burning, is due, no doubt, to the fires which constantly swept over this whole territory before the advent of white settlers. These fires made the prairies what they are and restricted the forest-growth on the debatable middle ground to the edges of sloughs and other depressions in the general surface of the ground where occasional trees were able to escape the effects of fire and grow to a very large size.

The Bur Oak (*Quercus macrocarpa*) is one of the common trees of the Oak-opening region, where it grows sometimes to noble size. A portrait of one of these large trees appears in our illustration on page 407. It shows the habit and appearance of this tree when it is allowed full opportunity for unimpeded growth in all directions.

This specimen is known as the "Cravath Tree," from the fact that it stands on the farm of Mr. Miles G. Cravath,

near the town of Whitewater, Wisconsin. The trunk girths at the ground eighteen feet and six inches. Three feet higher it is twelve feet three inches, and the beautiful cylindrical stem and ponderous limbs are perfectly sound, the tree being still in perfect health. The age of this great Oak can, of course, only be guessed, but it must have been a remarkable specimen in a region of fine trees long before a white man first floated over the surface of the limpid waters of the upper Mississippi.

We are indebted to Mr. Edward Salisbury, President of the State Normal School at Whitewater, for the photograph from which our illustration has been prepared.

The Florida Spruce Pine.

THE littoral belt extending from the alluvial lands of the Mississippi River eastward to the neck of the Peninsula of Florida presents no essential difference in climate or soil, or in the general features of vegetation throughout its entire length. Meteorologically it all belongs to one province. The line of sixty-eight degrees mean annual temperature follows the northern border along the thirty-first parallel of north latitude, and the isotherm of seventy-two degrees follows the sea-shore. The mean annual precipitation between these limits varies from forty-eight to fifty-four inches, showing but slight differences in its distribution throughout the year. Highly silicious deposits of stratified drift cover its surface, almost everywhere making sandy and gravelly soils or light sandy loams. The flat coast plain, intersected by large bays, and smaller inlets surrounded by marshes, is fringed along its shore by hillocks of loose and often drifting sand. The Long-leaved Pine or Cuban Pine form very open forests, which cover a large part of the plain. The damp, sandy soil of these flat-woods, devoid of surface drainage, is covered with a dense carpet of Cyperaceous plants, *Rhynchospora*, *Scirpi*, *Fuirenas*, *Eleocharis*, and numerous species of *Xyris*, *Eriocaulon*, and *Sarcenias*. Their monotony is relieved by groves of Live Oak and Wax Myrtle on the sands of the sea-shore and the more varied tree growth of the richer spots of the swampy depressions. Magnolias, Laurel Oaks, Water Oaks, Sweet Gum and Black Gum are the most prominent on the hammock-land, while the Bald Cypress represents the water-soaked banks of the rivers and their estuaries.

One who travels this coast from west to east is struck by the successive appearance of plants which are never or very rarely met with in the section left behind. If he leaves the eastern shore of the Bay of Mobile his attention is constantly directed to the plants which he has never encountered in the coast region between the western shore of the bay and the Mississippi delta. After crossing the extensions of the sea which intersect this coast, and entering the basins of the great streams which empty into them, he is surprised by the sudden appearance of plants not observed before, most of them becoming more frequent as he approaches the region which discharges its waters into the Atlantic. It would seem that while the wide bays of this coast, with the river basins connected with them, form the only obstacles to the general diffusion of plants over the littoral region of the eastern gulf states, yet to many species which are found on the South Atlantic seaboard these obstacles prove insurmountable, and absolutely prevent their spread toward the west. It would seem also that other plants whose centre of distribution lies toward the western confines of this belt are prevented by the same difficulties from making any progress toward the east. At another time it may be of interest to give instances of this restriction of different species to given limits, instances which cannot but excite interest in the problem of plant distribution throughout a region in which the same climate, soil and topographical features prevail.

Among the forest-trees which one would observe in connection with this distribution of plants, *Pinus clausa*, the Florida Spruce Pine or Sand Pine, would occupy a prominent place. Among the Pines of the southern United States this species is confined to the narrowest limits. It is found from the western boundary of Florida to Key West, where it was observed by Professor Sargent, and along the eastern coast of the peninsula, on the rolling uplands to their termination in the lower part of Volusia County, in the flatwoods and swamps of the further south. This Pine is strictly confined to an arid sandy soil; it flourishes on the dunes of pure white drifting sands which fringe the shore, where its roots often fail to obtain a firm hold, so that it often succumbs to the force of storms, and it is seen bent low in the direction of the prevailing

wind, and sometimes is entirely prostrate. On these sterile wastes the tree is rarely more than twenty or twenty-five feet high, while on the dry ridges with a more solid soil, as near Pensacola, it attains the dimensions of a medium-sized tree, and on uplands of the best quality, where the apparently barren ground is underlaid by a subsoil of the fertile tertiary marls, it arrives at the dimensions of a stately forest-tree, associated with mighty Magnolias, large upland Hickories (*Hicoria glabra* and *H. tomentosa*), Live Oaks, Laurel Oaks and Post Oaks.

On these fertile upland hammock-lands, as found prevailing back of Halifax Bay, the Sand Pine arrives at its best development. Trees over seventy-five feet in height and fully twenty-five inches in diameter are frequently seen here. In this best state of its growth the tree somewhat resembles the Spruce Pine, *Pinus glabra*, with which it is frequently confounded by the settlers.

By the structure of the wood as well as by morphological characters, this species forms, with *Pinus glabra* and *P. echinata*, a natural group of southern distribution. The leaves are in twos, with a short, deciduous sheath from half an inch to two inches or more in length, a half line wide, slender, flexible, concave and slightly keeled on the upper side. The cones are sessile, horizontally inserted during the first year and strongly reflexed as they reach maturity during the second year. They are from two and a half to nearly three inches long and from one and three-fourths to two inches wide when open. The exposed portion of their scales, with a slightly prominent umbo, is crowned by an erect, short and blunt prickle; they remain on the tree closed for several years. The bark of the young trees is rather smooth, roughish in those of fuller growth, furrowed and divided in square scales. The young shoots are tender. At all seasons and stages of growth, this Pine is readily distinguished from the Scrub Pine (*P. inops*) by the less rigid, more slender foliage of dark green, and from its allies by the ashy gray, reflexed, rigidly closed cones. It produces its fruit abundantly, and almost without failure, season after season.

The wood of this Pine is of a yellowish color, the broad sapwood of a lighter tint; it is soft, easily worked, but wanting in strength and elasticity, and is not durable. Hence as a timber-tree it is regarded as of no importance. The old trees of stunted growth from the sand-dunes along the seashore, with a wood of close grain and of greater toughness, are used for masts for the boats of fishermen and other small craft. As pointed out by Professor Mayr, this tree will in future be undoubtedly of importance in the forestry of the states of the lower south, when the reforestation of the denuded sandy Pine barrens, immense in their extent, is demanded by necessity.

Mobile, Ala.

Carl Mohr.

Improving Plants by Crossing.

WHILE it must be confessed that the science of plant breeding is far too little understood, one who has made a study of the history of the artificial development of varieties can hardly escape the conclusion that much more successful results have followed the intelligent crossing of varieties than the indiscriminate growing of seedlings, even though the number of plants by the latter method was very much larger. This is what we should naturally expect, and is in perfect accord with the experience of animal breeders. In the mere sowing of seeds, without reference to their inherited qualities, we are aiding Nature by the hand, but in the sowing of intelligently crossed seeds, we are aiding her by both the hand and the mind, and the mind is altogether the most potent agent.

The growing of seedlings is very generally practiced by amateurs to a greater or less extent. In so far as the motive is a hope of securing improved varieties the result is almost always disappointing, especially in the more highly domesticated plants. On the other hand, those who have sought to combine in a new sort, by crossing, certain specific characters possessed individually by others, have in very many cases been successful. Indeed, from the experience of the past, it seems almost safe to say that any two desirable qualities possessed by different varieties of a species may be combined by crossing. This result could not always be reasonably expected in a single attempt, and it is possible, also, that there are laws of correlation which would prevent the union of certain characters. But, in our present knowledge, the chances of securing improved varieties by crossing are so much greater than by selection from seedlings of unknown inherited qualities that the latter method is not at all to be recommended where the former is practicable.

The phrase, "intelligent crossing," has been used advisedly. The indiscriminate crossing of varieties is little more likely to

result in progress than the indiscriminate growing of uncrossed seedlings. We should know definitely just what characters we desire in our prospective variety, and should select our parents with the greatest care. Mr. Darwin made the statement, quoted here from memory, that "not one person in a hundred possesses the accuracy of eye and judgment necessary to the most successful breeder." If this is true of animals, it is certainly in a measure true of plants. A thorough knowledge and a careful study of the characters of the parents is indispensable to the highest success, and the same discriminating care is necessary in the fixing of the variety after the cross is secured.

A second argument in favor of crossing as a means of securing improved varieties is the fact that the crossing stimulates variation to a remarkable degree, so that we have not only a chance of combining certain definite qualities of the parents, but also of securing an almost infinite number of other combinations. It certainly is true that the variations resulting from a cross are not necessarily limited to the visible qualities possessed by the parents, but that entirely distinct types may appear in the offspring. If the aim were simply to secure variation, the best known way to accomplish this would be to cross the most widely differing individuals that could be obtained.

It is greatly to be desired that the subject of plant improvement should receive more attention from horticulturists. No other department of horticultural experiment offers a more inviting field. Fruits, vegetables and flowers are in themselves priceless possessions, and the introduction of varieties that make possible better or cheaper fruits, vegetables or flowers than we already have is certainly an end worth striving for. He who produces Wilson Strawberries or Concord Grapes for the market does his fellow man a transient good. But what shall we say of him who originated the first Wilson plant or the first Concord vine? He may be said to have made possible the supplying of the masses of our population through all the future with a delicious and wholesome fruit that had before been only within the reach of the comparatively wealthy. Surely neither statesman nor inventor has conferred upon his fellows a greater boon.

University of Wisconsin, Madison.

E. S. Goff.

Foreign Correspondence.

Messrs. Backhouse & Sons' Nurseries at York.

THE Holgate Nurseries, in the ancient city of York, are amongst the most famous of plant establishments in England. They have been in existence over a hundred years, and are now managed by the third generation of the Backhouse family. The first was the missionary nurseryman, James Backhouse, who combined with business capacity and a love of plants zeal in the spread of Christianity, which for ten years he taught to the natives of the Cape and New Zealand. He collected plants and sent them home to his nursery at York, amongst the most notable of his collections being numerous Filmy Ferns, which in the York nurseries have been and still are cultivated with marvelous success.

The nurseries have, of course, grown in extent and importance since his time, and they are now generally acknowledged to be amongst the best managed and richest known. The grounds consist of about one hundred acres, and the in-door department of some forty houses, mostly large and of modern design. Four broad walks run parallel from one end of the nursery to the other, and they are flanked by broad borders filled with the choicest of trees, shrubs and herbaceous plants. The arrangement is artistic, the most striking of the plants are conspicuously labeled, and every plant looks so perfectly at home that a walk through these borders alone is delightful to any one interested in gardening; and what a wealth of noteworthy subjects he will see, no matter at what season he goes. Conifers and other evergreens, ornamental at all times, groups of Roses, Spiræas, Ericaceous plants of all kinds, Syringas, etc., with hundreds of the best of herbaceous plants suitable for border planting. Long before the mixed border and a passion for hardy herbaceous subjects took possession of English horticulturists, the York nurseries had an unequalled collection of everything that was good and choice amongst alpine and herbaceous plants.

Stretching away from the borders are the long rows of fruit-trees, forest-trees, conifers and so on, all in good order, with a well-cared-for air about almost every plant. Many nurserymen lack the knack of making an attractive display or show an indifference to it which must surely be a mistake.

The rock garden is a great feature in this nursery, and since about 1,500 tons of rock and £2,000 in money have

been expended in constructing the rockery its extent may perhaps be realized. But, besides stone and money, a considerable amount of art is needed ere a good rock garden can be formed. The best judges say that there is no finer arrangement of stones and plants in England than this in the York nurseries. Huge masses of stone are piled up cliff-like in some places, and are backed by suitable trees, whilst from another point the stones are arranged to represent a glacial slip and their summit is clearly defined against the sky. The effect is delightfully deceptive, for whilst the actual height of the stones is only about twelve feet above the ground-level it appears to be at least twice that height. Winding around and amongst the piles of rock are streams, or small clear pools of water containing Nymphæas and other aquatic plants. In boggy nooks one sees healthy examples of *Darlingtonia*, *Sarracenia*, *Rodgersia*, *Todea*, and other moisture loving plants. Ferns there are in abundance, whilst *Cistuses*, *Campanulas*, *Ourisia*, *Cotoneasters*, dwarfed Pines, *Ramondia*, *Daphnes*, *Genistas*, Bamboos, Pinks of all kinds, *Veronicas*, *Saxifragas* innumerable, *Eurybias*, the North American *Cypripedia*, with many other suitable plants, all combine to make a picture such as cannot be seen elsewhere except in the Alps of Switzerland. No plant that is suitable is omitted, and the consequence is that visitors are enabled to see for themselves the position best suited to each plant both as regards its safety and effect in arrangement. There can be no doubt that this rockery has been the cause of many other rock gardens being formed by English horticulturists. The delights of this department of gardening are supreme; no ugly pots, no stiff stages, very little of the watering pot or abominable flower-stake, but instead every plant looking quite at home in its nature-like surroundings, and so happy as to require very little attention. Then there is constant change, infinite variety and perfect enjoyment whilst working amongst or inspecting them. A great deal may be said in favor of the rock garden, but it must be properly made and carefully planted at the outset. Mere heaps of stones with a handful of soil here and there in the crevices and plants stuck in anyhow are not rock gardens, but only a source of disappointment and disgust.

The rock garden at York is the show-room for the herbaceous and alpine plants, of which the collection is exceptionally rich in variety and extent. Whilst some nurserymen send collectors to bring home Orchids, the Messrs. Backhouse send annually to the European Alps their superintendent of the herbaceous department, who collects and notes the natural conditions of all the choicest and best plants.

In the houses there are, of course, Orchids in endless variety. *Cattleyas* and *Lælias* are grown in thousands,—well grown, too,—and that in houses for which the thinnest muslin shading only is used even in the sunniest weather. The Messrs. Backhouse were among the first to prove that many Orchids thrive much better when scarcely shaded even in midsummer, than when shaded heavily, as is usually practiced. Mexican Orchids were in splendid health, and the *Cattleyas* were pictures of vigor at the time of my visit.

Catasetum Bungeorhizii is largely and well grown in a moist warm house. And hereby hangs a tale. Last winter a plant of this Orchid was accidentally kept moist by a roof-drip, and this plant wintered better, grew more vigorously and flowered more freely than those which had been dried off. I have myself proved that some *Catasetas* grow and thrive if kept in a moist house all the year round. It may be unnatural, but it succeeds nevertheless.

Cattleya gigas, *C. aurea* and *C. Dowiana* have flowered extremely well, the result of growing them in baskets suspended close to the ventilators in the top of a span-roofed house and scarcely shaded. There are *Cypripediums* of almost every kind, which is saying a great deal, seeing how very numerous the kinds are now. *Dendrobiums* are well grown and numerous represented; *Cœlogynes*, rare as well as popular species, were also full of vigor. I might run through the whole catalogue of garden Orchids and say with truth that they are almost all grown well in the York nurseries. The best and rarest are represented. Such fine Orchids as *Odontoglossum Harryanum* are grown in large quantity. The *Disas* were mentioned in last week's issue, but I may note here some good examples of *D. racemosa*.

Hard wooded plants are in favor with Messrs. Backhouse, whilst such choice greenhouse plants as *Rogeria gratissima*, *Luculia gratissima*, *Daphne Indica*, *Lapagerias*, *Asparagus decumbens*, a most elegant plant when grown in hanging baskets, Japanese *Rhododendrons*, *Pleroma elegans*, are grown in quantity.

In the stoves one may find all the popular favorites, besides many that are unknown in the majority of gardens—for Messrs. Backhouse have a taste for other plants than the big flowered

and the gaudy. *Adamia versicolor*, a cousin of the *Hydrangeas*, was in flower; treated as a stove plant it apparently blooms freely, whereas in a greenhouse it grows well but does not flower. It has large heads of bluish lilac flowers, not unlike those of a *Sonerila*; the plant is about a foot high. *Combretum purpureum* was a cloud of bright crimson on the roof of one of the stoves: *Sonerilas*, *Bertolonias*, *Ouwirandra fenestralis*—these I noted as being unusually well managed.

Ferns are a specialty in these nurseries. Nowhere, not even at Kew, is there so rich a collection of Hymenophyllums, Trichomanes and Todeas, collectively known as Filmy Ferns. An underground rockery of considerable size is entirely planted with them, and Fern connoisseurs enter it with feelings of delight and admiration. Only the favored are allowed to see it, but it is worth going a long way and taking a good deal of trouble to see. There are besides two houses entirely filled with these delicately beautiful Ferns, the rarest and choicest species being represented by large, well furnished specimens, some of which are at least twenty years old. Few people grow these Ferns, because, as a rule, beginners fail with them. An hour's neglect will probably work mischief that it will take years to undo. But when once their requirements are understood they are very easy to cultivate. The famous Cooper-Forster collection, now at Kew, was formed by a surgeon, and cultivated by him for many years in a house built against the window of his surgery in Grosvenor Street, right in the heart of London.

A large house is arranged inside like a natural fernery, with rockery and water, and is planted with all kinds of tree and other Ferns. *Gleichenias*, beautifully grown and numerous in kinds, almost fill another house, whilst others contain a large collection of tropical Ferns in beautiful condition.

York is a little out of the ordinary track of the visitor interested in gardening; but no American who finds delight in inspecting a well kept garden, rich in rare and beautiful plants, should visit England and not see the nurseries of the Messrs. Backhouse at York.

London.

Visitor.

New or Little Known Plants.

Rosa multiflora.

THIS species is an old inhabitant of the Arnold Arboretum, where it was raised from seed sent by Max Leichtlin in 1874. It was first made known by Thunberg, who discovered it in Japan, and published the first description in his "*Flora Japonica*," printed in Leipsic in 1784. It has only been known, however, in a living state in recent years, the earliest description of it as a garden plant appearing in the *Revue Horticole* for 1876, where it is stated to have been introduced into France about 1862 by André Leroy of Anger, who obtained it from China.

*Rosa multiflora** is a vigorous plant with stout branches eight or ten feet long, recurved above the middle, and forming a dense mass of brilliant foliage, which reaches, when the plant is abundantly nourished and allowed free room for full development, a breadth of twelve or fifteen feet. The branches are stout, more or less zigzag, glabrous, light green, destitute of prickles, and armed with stout, flattened, recurved spines. The leaves are six or seven inches long, unequally pinnate, with stout pubescent petioles and conspicuous, deeply cut, comb-like stipules. The leaflets are distinctly petiolulate, ovate or obovate, the apex often contracted into a slender point, and are conspicuously and sharply toothed above the middle; they are dark green and lustrous on the upper surface, paler and slightly puberulous on the lower, especially along the stout midrib. The flowers are produced in axillary and terminal widely-branched corymbs, composing a pyramidal, rather one-sided, terminal panicle eight or ten inches long and four or five inches broad, the slender branches covered with scattered hairs. The flowers† are an inch across when expanded, with ovate-lanceolate, entire, pointed sepals, pubescent on the outer surface, deciduous

*Thunberg, "Fl. Jap.," 214.—Franchet et Sevatier, "Enum. Pl. Jap.," i., 134.—Crépin, "Bull. Soc. Bot. Belg.," xliii., 250; xviii., 278.—Forbes & Hemsley, *Jour. Linn. Soc.*, xxiii., 253.—*Bot. Mag.*, t. 7119.

†*R. polyantha*, Siebold et Zuccarini, "Fam. Nat. Pl. Jap.," i., 20.—Carrière, *Rev. Hort.*, 1876, 253, f. 49-53.

‡ In the recent figure of this plant in the *Botanical Magazine* the petals of some of the flowers are represented as pink, and in others as faintly shaded with pink. In all the plants raised in the Arboretum they are pure white.

from the fruit, and half the length of the pure white obovate petals, which are deeply lobed at the apex. The ovaries are villose, the long, slender, exserted styles cohering into a column. The fruit is long-stalked, elliptical, a quarter to half an inch long, with obtusely-angled, slightly pilose stones.

has been introduced into gardens for many years. It may be grown either as an isolated specimen on the lawn, or it may be planted on the margins of shrubberies or on rocky banks, for which purpose the pendulous habit of the branches admirably adapts it. It may be used, too, as a



Fig. 51.—*Rosa multiflora*.—See page 404.

Rosa multiflora is exceedingly free blooming, and toward the middle of June the plants are covered with the great clusters of Blackberry-like, sweetly fragrant flowers, in which the golden-colored anthers make a charming contrast with the snowy white petals. It is extremely hardy; it grows rapidly, and, where sufficient room can be found for it, it is altogether one of the most desirable shrubs that

hedge plant in the manner that the Cherokee Rose is used in some parts of the southern states.

There are two forms of this plant in the Arboretum, the one which appears in our illustration, and a plant received from Europe as *Rosa polyantha*. This is less vigorous than the other form; the stems are shorter, the flowers are smaller, and appear about ten days earlier. The plants

sometimes suffer in severe winters, and altogether it is the less beautiful and desirable plant of the two.

Rosa multiflora produces seed in the greatest profusion. This germinates readily; and plants may be raised also from cuttings or by layers.

The double-flowered form of *Rosa multiflora* was introduced into England as early as 1804 by Mr. Thomas Evans. It is known as the Bramble-flowered Rose, and is not rare in gardens, where many varieties have been cultivated at different times. The variety *Platyphylla*, which I do not know in any American garden, was described by Lindley, who published a figure of it in the *Botanical Register* (t. 1372), and who called it the most beautiful of all climbing Roses. He noticed, however, that the stems suffer sometimes in winter unless protected.

The results obtained by European rosarians by crossing *Rosa multiflora* with different forms of *Rosa Indica* and of *Rosa semperflorens* are seen in the so-called Polyantha Roses, which have of late years attracted considerable attention. These are not hardy here in the open ground, but Mr. Dawson has obtained a hybrid by crossing the Japanese species with various dark-colored Hybrid Perpetual Roses which is exceedingly promising. The plants obtained by these crosses are hardy, with good foliage, and produce clusters of small, dark-colored, highly-scented flowers. These experiments, although they have not been carried on during a sufficient period to be conclusive, are highly suggestive, and promise at least, a new race of hardy climbing Roses of peculiar beauty and interest.

C. S. S.

New or Little Known Orchids.

ODONTOGLOSSUM × LEROYANUM, Castle.—This is a most interesting artificial hybrid, raised in the collection of Baron Edmond de Rothschild, at Amandvilliers, near Paris, by M. Leroy. It was obtained about five and a half years ago from *O. crispum*, crossed with the pollen of *O. luteo-purpureum*, between which species it is quite intermediate. It is interesting because it is the first artificially raised hybrid *Odontoglossum* which has flowered, and also because it proves the parentage of *O. × Wilckeanum*. That plant has always been considered a natural hybrid between the two species in question, and *O. × Leroyanum*, though perhaps distinct enough horticulturally to retain the name, is quite identical from a botanical point of view.—*Gardeners' Chronicle*, June 7th, p. 704.

ZYGOPETALUM JORISIANUM, Rolfe.—A very distinct and handsome species, belonging to the section *Euzygopetalum*, but with a three-lobed, fimbriate lip and fimbriate column-wings. The lip is cream-white, with a broad yellow margin to the side lobes, and a purple crest, while the segments are green, heavily marked with purple-brown. The habit is somewhat like *Z. intermedium*, but the pedicels are much longer. It was introduced by M. Bungeroth from Venezuela, for the Society "L'Horticulture Internationale," of Brussels.—*Gardeners' Chronicle*, June 7th, p. 704.

CALANTHE × MYLESII, Williams.—This is a hybrid raised by Mr. Myles, of Ryde, Isle of Wight, between *C. vestita nivalis* and *C. × Veitchii*. There is, however, little trace of the latter in the plant, which bears pure white flowers like *C. vestita* in shape, with a lemon-yellow throat to the lip.—*Warn. and Will. Orchid Album*, ix., t. 402.

CATTLEYA LABIATA, Lindl., var. WAROCQUEANA, Rolfe.—This is one of the numerous forms which botanically are grouped under the comprehensive term, *C. labiata*, Lindl. It is very variable, and its relation to the other forms of this beautiful group is not yet clearly made out, though it is supposed to be a distinct geographical variety, in the same way as are *C. Mossiae* and *C. Trianae*, and others. It is said to be from a new district. It is being distributed by the society "L'Horticulture Internationale," of Brussels, as *C. Warocqueana*, Linden, under which name it was awarded a diploma of honor at a recent meeting of the Orchidénne of Brussels.—*Gardeners' Chronicle*, June 14th, p. 735.

CATTLEYA × INTRICATA, *Rchb. f.*, var. MACULATA, Rolfe.—A very pretty variety, with many rosy purple spots on the sepals and petals. It was collected on the mainland of Santa Catharina, Brazil, and is now in the collection of Mr. Malcolm Cook, of Kingston Hill. It is evidently a natural hybrid between *C. intermedia* and some form of *C. guttata*.—*Gardeners' Chronicle*, June 21st, p. 763.

CYPRIPEDIUM × AYLINGI, Castle.—This is a very beautiful hybrid, raised by Mr. Ayling, gardener to Mr. A. J. Hollington, of Enfield, from *C. niveum* fertilized with the pollen of *C. ciliolare*. The plant is very similar to *C. niveum* in habit, though the shape of the segments is modified in the direction of *C. ciliolare*. The lip is pure white, and the segments white with numerous dots of light purple, which are arranged somewhat in lines. It was awarded a first-class Certificate by the Royal Horticultural Society on June 10th, and a Botanical Certificate by the Royal Botanic Society on the following day.—*Journal of Horticulture*, June 12th, p. 480, Fig. 74; *Gardeners' Chronicle*, June 14th, pp. 747, 748; June 28th, pp. 792, 797, Fig. 131.

CYPRIPEDIUM × VIPANI, Rolfe.—Another very beautiful hybrid in the way of *C. Aylingi*, though quite distinct. It was raised in the collection of Captain Vipan, Wansford, from *C. Philippinense* fertilized with the pollen of *C. niveum*. As in the last, the lip is pure white, though more compressed laterally, while the segments are narrower, white, the dorsal sepal with eleven and the petals each with nine longitudinal stripes of bright purple. It is strongly stamped with the character of *C. niveum*, as indeed are all the hybrids which have this species for one of the parents.—*Gardeners' Chronicle*, June 28th, p. 792.

R. A. Rolfe.

Cultural Department.

Notes on Shrubs.

CONSIDERING their value as ornamental flowering plants and their habit of blooming when comparatively few other woody plants produce blossoms, it is surprising how extremely rare the hardy Heaths and Heather are in American gardens. This is the more remarkable when we think how much these plants are prized by many of the immigrants from Britain and the efforts which many of them have made to introduce their favorites from their native homes to the new, rich soils of this country. In a comparatively few cases the importations seem to have been successful. This is attested by the little patches of Heather which have occasionally been found in the older settled parts of the country along the Atlantic seaboard. Whether all the Heather in the localities where it has been found in Massachusetts, Maine, Nova Scotia and Newfoundland has become naturalized since the colonization of the country by Europeans, may remain a doubtful question; but the origin of several of the so-called wild patches has been clearly traced to the care and enthusiasm of some Scotch or Irish settler.

One reason why so many failures have occurred has no doubt been due to conditions unfitted to their growth and best development to which the plants have been introduced. The severity of our winter climate and the general necessity of some protection is also against them. Much of our heavy clay soil is unsuited to them, and it seems, as a rule, that they degenerate and die where there is much limestone or lime in the soil, unless a spot is specially prepared. In such cases the bed should be composed of peaty soil or leaf-mould mixed with about a third or more of sand, and it should be at least a couple of feet deep. The best success will result where the plants have fairly equable, but not too much moisture. Although the Heather will grow in shady places, the best specimens will be produced where there is plenty of light and air. Artificial propagation from seed is slow and troublesome, and the plants are more easily grown from cuttings or layers. By the last methods, also, any particularly free flowering or otherwise peculiar plant may be indefinitely perpetuated. In reproducing from cuttings the ends of the growing shoots are taken off and placed in sand and covered with glass until roots are formed. Where a plant is already established, however, it is much easier to propagate a few plants from it by layers. Wherever a spreading stem becomes slightly covered with soil it in time produces roots, and as soon as these are sufficiently numerous the new plant may be severed from the parent and safely transplanted.

For our northern gardens the most valuable of the Heaths is the common European Ling or Heather (*Calluna vulgaris*), both on account of its greater hardiness and also because there is quite as much variation in the form and color of its flowers as in any other hardy species. Besides the purplish red flowered type there are varieties or forms with deeper or paler colored flowers and some that are pure white. A very pretty and interesting form has large double rosette-like flowers. Plants which vary from the type in habit are generally not so desirable for garden culture. One or two very dwarf or compact forms are quite pretty, and make curious little tufts, but this diminutive habit does not seem to be accompanied by fine flowers. It is best to renew these and most of the other

Heaths every four or five years, for, although the plants live for a very much longer time, the old stems give them a straggling appearance. There is a good deal of difference in the time of flowering of different plants of Heather. Blossoms are often produced early in July, but generally in this latitude the plants are in the best flowering condition in the first and second week of August.

The Cornish Heath (*Erica vagans*) is much less hardy than the common Heath, and requires more protection to be

averaging about a quarter of an inch in length, are borne in close terminal clusters of from eight or ten to fifteen or twenty. The first flowers open about the middle of June, and the best flowering period is in the early part of July, but blossoms are freely produced throughout the month, and a few still remain when the two preceding species are in their most showy condition in early August.

The little Gray or Scotch Heath or Heather (*E. cinerea*) requires more care and frequent renewal of the plants in order



A Bur Oak (*Quercus macrocarpa*) in Wisconsin.—See page 402.

equally satisfactory. The small showy pink, or sometimes nearly white, flowers, are borne thickly around the upper portions of the branches, and are occasionally crowded so near the extremities as to form almost globular clusters. They appear at the same season as those of the Ling.

Erica tetralix, or the Four-leaved Heath, with some protection, is fairly hardy, and well worth cultivating. The foliage has a dusty grayish hue, and the whole effect of the plant is not so pleasing as either of the other species. Its red flowers,

to thrive well. The very showy, dense terminal racemes of reddish purple flowers are produced during the summer and autumn, but most freely in the latter part of July and in early August. There are forms with darker or lighter or with white blossoms.

Erica carnea has been several times mentioned in these pages for its early spring-flowering habit. It well repays a little winter protection in the fresh pale red flowers which begin to open in the late autumn and may be gathered bright and

unfaded from beneath the snows. Usually only a small proportion of the buds, which are now (August 12th) well formed, open before the spring.

Dabæcia polifolia, or St. Dabæc's Heath, as it is called in Ireland, where it is native, is one of the prettiest and largest flowered of the Heaths which can be grown in the climate of New England. The barrel-shaped blossoms vary from a third to about half an inch in length. The color of the typical flowers is dark purple, but there is also a pure white form in cultivation. The plants are low-growing, spreading and compact; and the flowers are produced in loose racemes on long stems above the mass of shining evergreen foliage. This is a pretty little species for planting in rockeries. But it grows well in any suitable soil, and produces flowers for a long period of time, although most profusely in late summer, when flowers on woody plants are uncommon.

Arnold Arboretum.

J. G. F.

Devices for the Fruit Garden.

AT this moment I have four fine Mazzard Cherry-trees covered with mosquito netting to keep off the birds. When only a few Cherry-trees are grown, as is now the case in central New York, robins, cedar birds and cat birds will take every cherry within five days of their coloring. But this fruit is not only very delicious to me, but invaluable as a health preservative. In my judgment the sour Cherries when fully ripe are the most wholesome of all fruits. Generally I cover not only Mazzards, but Early Richmonds and Late Montgomery. Of course the cost of covering will be more than the value of the fruit as a market product; but the same cover will last for two years. Thus protected one can gather delicious Cherries from July 5th down to the end of September. The fruit does not decay badly before September, but ripens and then gets ripier and ripier till the fruit is good enough for Asgard. This device is valuable when one cannot induce his neighbors to plant Cherry-trees by the thousand and so have enough for birds and planters. When we grew a few Raspberries it was just the same; the birds took the bulk of the crop; but now the cat birds and robins are welcome to help themselves and pay for the privilege with music. We do not miss what is taken because we harvest a hundred bushels and are glad to pay a percentage to an orchestra. The Cherry-tree ought to be planted again in this state as freely as it was fifty years ago. The Black Knot has entirely left off troubling them here and therefore even the lazy can grow them.

My remedy for Currant-worms is to plant Gooseberries about the Currant-gardens, and on these the worms first appear. If thoroughly dusted then the attack is far less severe on the Currants. They prefer the gooseberry just as they prefer the white currant to the red. Of course, such preferences are not discoverable when very little care is taken of the bushes and worms multiply beyond all measure. The currant ranks next to the cherry as a matter of wholesome diet. It is to be preferred far above all other berries.

I have Quinces again bearing like the old-fashioned Quince-bushes of my father's day. Thirty years ago I found it difficult to get crops, and till now have only had an occasional peck of quinces. Two years ago I drew the limbs together in November with stout twine, then wound on straw or hay. The result has been heavy crops of fruit. The Quince needs only slight protection here. It is best to plant on a south or south-east slope, and have an evergreen hedge or tight board fence to the north.

I had great trouble with my berry gardens, owing to the hopping down and tangling of the bushes. To remedy this I set stakes about twenty feet apart in the row, and fasten to these one wire, about four feet high. To this wire I tie the new canes in September with strong twine, two to four in a bunch. Then I leave the canes standing six feet high to bear. They are never broken down in winter, and never in the way in summer. The cost is a trifle.

Clinton, N. Y.

E. P. Powell.

Two Uncommon Plants.

I HAVE lately had two plants in flower which I have never seen elsewhere, and think worthy of more extended cultivation. They both belong to the fibrous-rooted section of the Iris family.

Sisyrinchium striatum, like most of the genus, is native to the lower slopes of the Andean chain, and is the finest of all species known to me, from a gardening point of view. The foliage grows to the height of thirty inches, is flat and flag-like, as in most of the family, having a width of nearly two inches. It grows in dense tufts and is of a beautiful gray-green color, so that if it never bloomed it would still be highly

ornamental. The flower-stalks are often more than three feet high, and are densely clothed for many weeks with closely clustered flowers, three-fourths of an inch in diameter, light yellow, marked with fine lines of a darker shade. Each flower lasts but a day, but new ones are constantly expanding. My plant began to blossom in April, and was in full bloom until the middle of July, and even now, August 11th, there are some flowers to be seen.

This species may be propagated by division, by cuttings of the flower-stem, and, best of all, by seeds, which are abundantly produced. The plant, whose dimensions I have given, is in an eight-inch pot; it is likely that it would grow to a larger size if planted out.

Orthrosanthus multiflorus is an Australian species. Its manner of growth is much like that of the plant just described, but it is not so tall, its foliage is dark green, instead of glaucous, and much narrower. The flowers, also, are less numerous, though they continue to appear for nearly the same length of time. They are nearly an inch in diameter, and are of a beautiful porcelain blue. There is no difficulty in growing this beautiful plant, nor is it at all shy in flowering; every year when April comes round the spikes push up plentifully. Both of these plants derive much benefit from being plunged in the ground during the autumn, care being taken to take them in-doors before frost.

Canton, Mass.

W. E. Endicott.

Hardy Flowers for Florists' Use.

IT needs no argument to show that hardy perennials should not be neglected where a mixed collection of plants is grown for sale; but it does not seem so generally understood that many of them are valuable for cut flowers and well deserve the attention of the commercial florist, especially since these plants are well able to take care of themselves, and especially in the winter, when all other things tax all the resources of the cultivator. What can exceed for simple elegance a vase filled with Painted Daisies? And yet how seldom are these single Pyrethrums grown by the florist. They are easily raised from seed and flower the first year. The beautiful perennial Candytufts, too, are much better than the annual kinds. *Iberis correaefolia* and *I. sempervirens* are invaluable where pure white flowers are desired about Decoration Day. The double *Achillea serrata*, a somewhat new plant, will speedily supersede the old *A. ptarmica*, to which it is as superior as the Japan Anemone is to the common Wood Anemone. And certainly no one who grows annual Sunflowers can reasonably neglect the perennial one, so perfect in form, so free flowering and so durable when cut. It is rather singular that this double Sunflower, which I could never persuade to survive a New Jersey winter, has lived out here for years without attention.

The Coreopsis, especially *C. lanceolata*, is pretty well known, but it is not generally known that there are two plants being distributed under this name. The one is a fair plant, but the other is a far better one. It is to be hoped that by next year this case of mistaken identity may be cleared up. *Gillenia trifoliata* and *G. stipulacea*, two beautiful native plants, are both invaluable for mingling with cut flowers, owing to their pure white color and their graceful position on the stems. Both should be grown, as the one follows the other in the order named, and flowers can be had for over a month. The Gypsophilas, especially *G. paniculata* and *G. Steveni*, are most useful among other cut flowers. No other hardy plants have such an airy appearance and loose sprays scattered among other flowers in a vase will surround the whole as with a delicate mist or halo.

Doronicums are sure to be popular, and the leading nurseries are preparing themselves with large stocks, so that they can be purchased reasonably in fall, and if placed in a cool house where Mignonette or Violets are grown, beautiful yellow flowers three or four inches across may be had in February and March from *D. Caucasicum*, *D. Clusii* and *D. plantagineum excelsum*. The flowers of these plants last long, even when cut. The Larkspurs are always popular. Of the single kinds, *D. formosum* is hard to excel among dark blues and it comes readily and true from seed. The lovely sky-blue *D. Belladonna* would be indispensable if it could be raised otherwise than by division, for unfortunately it does not produce seed, owing, it is said, to its hybrid origin. But perhaps the Larkspurs of the future are the double ones. The best way to have them and to keep them is to get named double kinds, save the seed, and raise your own, weeding out the single ones—about ten per cent. of the whole. Larkspurs thus raised will have a strong constitution suited to the locality in which they are grown.

Few persons who have not seen the fine varieties of *Pæonia* that are now to be had can imagine the wonderful range of color and the fragrance of the flowers. They will grow in any good soil, and should not be disturbed except for division—once in three years. *Daphne Cneorum* is essentially a florists' plant, though not an herbaceous one. It is quite hardy, flowers for six months, and is easily grown in free sandy soil. One of the questions to come before the Florists' Convention this week is, "Can Hellebores be Grown to Advantage by the Commercial Florist?" If I might be permitted to express an opinion in advance, it would be emphatically in the affirmative. Had I a commercial place, with a shady border at the back of a greenhouse, I would not hesitate to plant largely the varieties (not the type) of *Helleborus niger*, of which there are now nearly a dozen, all in some degree an improvement upon the older plant. When cold weather comes frames and sashes could be placed over the plants, and the flowers thus protected would yield profitable and speedy returns. The trouble is that Hellebores are usually imported in fall, when they really ought not to be planted until spring.

Omitting other flowers, I may say in conclusion that florists who have ever grown the Eulalias for their fine flower-spikes always find that they meet with universal favor when cut and dried for winter decoration. They will last for years, but are best renewed annually.

South Lancaster, Mass.

E. O. Orpet.

Alocasias.

THIS interesting group of stove Arads includes a considerable number of distinct species and varieties, some of the latter of garden origin being among the finest warm-house foliage plants, while several of the original types are equally desirable. There is much diversity in the form and marking of the leaves of the various sorts, so that most of them are readily recognized.

They are natives of the East Indies and various portions of the Malay Archipelago, though probably not at any considerable altitude, and therefore enjoy warm-house treatment and plenty of moisture during the period of growth, and these conditions will be found essential to their well-being. At the same time it should be remembered that during the winter most of the Alocasias make but little growth, and therefore require but little water; in fact, some of them grow better after a season of entire rest, *A. Fenningsii* and *A. Marshallii* being among this class.

In regard to soil, the Alocasias prefer a light, open compost, as their thick, fleshy roots will not make much headway in a heavy or sodden soil, and for varieties such as *A. metallica*, *A. Sedeni*, *A. Veitchii*, *A. Sanderiana* and *A. Thibautiana*, and others of like characteristics, a mixture composed of rough fibrous peat, with perhaps one-fourth of chopped sphagnum and some sand, will be found most suitable, while *A. macrorrhiza*, *A. zebrina*, *A. Fenningsii* and others of this class make most satisfactory progress when potted in a compost formed of the above ingredients, with the addition of a third part of coarse turfy loam and some dry cow manure, these species being comparatively gross feeders. These plants should in all cases have good drainage, for while they enjoy copious waterings when in full growth, they soon lose vigor when exposed to stagnant moisture. In bright weather they may be syringed freely, especially underneath the leaves, to keep away the red spider; otherwise the Alocasias are but little subject to the attacks of insects.

Prominent among the older varieties may be mentioned *A. metallica* (which is also recognized under the name of *A. cuprea*), a handsome kind, with large bronzy green leaves, which are purplish on the under side and strongly outlined by the prominent veins. This species was introduced from Borneo some thirty years ago, and will still bear comparison with some more recent introductions. *A. Sedeni* is somewhat similar in form and ground color to the preceding, but is improved by the addition of ivory white veins. This variety is one of the finest for exhibition purposes, producing very large foliage and also being of rapid growth.

A. Sedeni was the result of a cross between *A. Lowii* and *A. metallica*, and has been in cultivation for a number of years. *A. Veitchii* is another effective species when well grown, its leaves being of rather different form from those above mentioned, and standing up well on long foot-stalks. They are deep green on the upper side, with whitish veins, and of a peculiar slaty hue on the reverse side. This is also a native of Borneo, and has been long in cultivation. But probably the most striking in appearance of the whole genus is *A. macrorrhiza variegata*, which forms immense leaves of bright green, more or less marked with pure white variegation. The

variegation is somewhat irregular, frequently appearing in large patches, while on other leaves it will be so mixed with the green as to give a marbled effect. *A. macrorrhiza variegata* is one of the strongest growers in the family, and enjoys plenty of heat and an occasional watering with liquid manure. It is said to have originated under cultivation in the island of Ceylon, and may certainly be considered one of the many botanical prizes received from that favored home of tropical vegetation.

Among the smaller growing sorts may be mentioned *A. Fenningsii*, which has leaves about a foot in length, bright green in color, with the spaces between the chief veins occupied by large blotches of dark chocolate color, sometimes almost black. This species is of quick growth, and produces a large number of offsets from its bulbs, which render it of very easy propagation. Of similar character is *A. Marshallii*, though possibly more ornamental, its foliage having in addition to the dark markings of *A. Fenningsii* a central band of grayish white. These two species are natives of India, and have been known in our gardens for more than twenty years.

Another fine species, and one that is not very common in American collections, is *A. zebrina*, which produces almost erect, sagittate leaves of dark green, these being supported by strong foot-stalks that are light green in color and banded zebra fashion with a much darker shade.

The later additions to the Alocasia family have also been numerous and valuable, many of them being hybrids of great beauty, while a number of remarkably fine species have also been introduced.

One of the newer sorts that should not be overlooked is *A. Sanderiana*, a remarkably fine species with sagittate leaves, the margins of which are deeply sinuated and marked with white, as are also the ribs.

Other fine species are *A. Chantrieri*, a hybrid from *A. metallica* and *A. Sanderiana*; *A. Thibautiana*, a species from Borneo; *A. Lucianii*, the result of a cross between *A. Thibautiana* and *A. Putzeysi*, and *A. Lindenii*.

Holmesburg, Pa.

W. H. Taplin.

Hardy Annuals.

ANY ONE who cultivates a collection of plants during a few leisure hours, and has a fondness for experimental gardening, is sure to find days when everything grows the wrong way or not at all, and when failures seem to make up the entire history of the garden. At such times one turns for comfort to the sturdy old plants, perennial or annual, which are always reliable, and require so little attention that, like healthy children, they are apt to pursue their course with little notice. There are numerous hardy annuals which are readily established in the garden, where they will annually reproduce themselves from self-sown seed if the ground is not upset every spring. One learns to expect the annual appearance of these favorites and to welcome them as old friends. Seeds of these plants should be sown from late summer to early winter, and as a rule they should not be covered deeply.

Among the plants which I annually expect are *Argemone grandiflora* (the Prickly Poppy), a good old plant, with beautiful thin white flowers, each holding a cluster of yellow anthers. The foliage is smooth, glaucous and spiny. The branches are irregular and angular in their growth, giving the plant a most distinct appearance.

Chrysanthemum Myconis, which was had from B. K. Bliss some years since, seems a variety of *C. Segetum*, but of better habit and with similar flowers. It adds a gleam of color here and there to the border.

Gypsophila muralis, the dainty little Baby's Breath, is a free seeder, and preserves its race on the edge of a border, but is easily crowded out. It is invaluable for mixing with cut flowers.

Calliopsis tinctoria is one of the best known of annuals, but it is not seen at its best except where full-grown plants have had ample room, when they will cover a diameter of three to four feet, and reach a height as great. Writers who are continually advising us to "give every plant room to reach its full development," do not seem fully aware of the possibilities of well-grown annuals.

Poppies, of course, once grown in a garden may be found in every corner, for their seed crop is enormous and very tenacious of vitality. But for persistent reproduction commend me to the Morning Glory, which it seems almost impossible to eradicate once it has well bloomed in the garden. The seeds will apparently lie dormant for years, ready to germinate quickly under proper conditions. Of course, with care, one could weed out every plant, and at length exterminate it; but one may pursue this course ever so diligently until some fatal day when a plant which has been hiding in some out-of-the-way

corner is suddenly caught in the act of blooming. Human weakness hesitates to destroy so sturdy and beautiful a flower, and the mischief is done for another long course. On the whole, with all their beauty, I am content to admire these with *Petunias* in my neighbor's garden. *Humulus Japonicus* completes a worthy trio of persistent seeders, and is perhaps the worst of the lot. The seeds are light and are blown all over the garden. They germinate with the first warmth of the year. They run and twine in the most aggravating way, making them difficult to eradicate. They would be capital plants for covering large bare places.

Adlumia cirrhosa (Allegheny Vine) is a much neater and more pleasing vine for a small garden, though the withering flowers give it a rather unthrifty look for a prominent place. Though a biennial, it seems never to desert the garden. *Calendulas* may usually be found in the spring, as also a few *Asters*, ordinarily single, and in a dry spot, after a favorable season, *Nasturtiums* even may be found in plenty, and there is a world of pleasure in a good breadth of this beautiful flower.

Union County, N. J.

G.

The Forest.

Suggestions for Restoring Wasted Forests.

ARGUMENT is no longer needed to show the necessity of a more definite policy for the maintenance of our woodlands. Aside from a closer and more economical use of raw material, there is but little difference between present forest-management and that of a century ago. There is the same cutting of everything that it will pay to handle, and the same abandoning of everything else—land and all—to take care of itself as best it may. That some lands become reforested in time, and hence productive, is due rather to kind Nature and good luck than to any intelligent labor or protection. For the most part forest-lands are practically abandoned, and the work of reforestation is indefinitely delayed. Time was when much woodland was cleared for cultivation, but now, with sharp competition under new economic conditions, such areas in the older states grow fewer and fewer, and it has become evident that all lands not profitable for agriculture should be utilized for forest-purposes.

The artificial planting of forests, much as we may desire to see it undertaken, seems yet a long way from us in the eastern states, save possibly on a small scale, or to serve some incidental purpose. The conditions which will make it either feasible or profitable are not visible on our horizon. We cannot create at once that public sentiment which will make effective those laws against trespass and firing, without which the labor would be in vain. We can scarcely hope to enlist the intelligent and painstaking care necessary to secure the best results, nor that faith which is willing to incur so heavy a present expenditure for the sake of remote gain. Time may overcome all these difficulties, and a future generation may adopt a scheme of forest-management as elaborate as that which any part of the world affords. But for our country to-day what can the advocates of forestry-reform offer and recommend?

The answers to this question will doubtless differ for different parts of the United States. Speaking for the eastern states only, and more particularly for Pennsylvania, it is plain to me that very considerable areas are unfit for profitable cultivation or even for grazing, and that their most natural and profitable use is as forests. How can these forests be maintained? In the majority of cases there is a natural reforestation going on through the seeding or sprouting of old trees. While this seems for a time to be ineffective, and the young growth is smothered by weeds and bushes, it commonly gains the mastery in a few years, and, if it meets with no further check, occupies the ground and makes the well known "second growth." In some parts of the country this second growth has become a small but valuable factor in maintaining forest-conditions. In all it is capable of becoming a larger and much more important one. Indeed, in it we have the hope for the forestry of the near future, and toward its production and conservation we should bend our energies. That the second growth is not of the same kinds of trees nor so valuable as the first, are statements only partly true and subject to much exception. Acting upon Nature's method of forest-restoration, that process may be supplemented, and even replaced in some cases by artificial seeding. Some experimental work of this kind looks promising now, but it is too early to speak definitely of either the cost or result of it. It may be argued that, excepting the expense incurred, the same difficulties inhere in this

method of reforestation as in any other. This is true, and it remains to be seen to what extent these difficulties may be obviated. The damage to young woodlands by fire is certainly very great, and is commonly underestimated; the damage from trespass in various forms is no inconsiderable item. Laws, often very stringent ones, have been enacted for the protection of woodlands, but they are practically of no avail in so far as fire is concerned, since punishment under them is of rare occurrence. In the eyes of people generally forest-property has an insignificant value unless it has reached maturity and can be immediately turned into money. If it is isolated or too young to be of immediate use it is looked upon as of little account. Unfortunately the owners themselves are generally too indifferent to give sufficient care to their property. Either because of lack of knowledge and of faith in the productive value of such lands, they make little effort for self-protection, and through their indifference and the lack of suitable policing, the natural forest-lands are too often sparsely covered, the trees grow old before their time, and are useful only as a commentary on our shortsightedness. The danger and the damage to the community from this unfortunate state of affairs are well known, and it remains to inquire if anything can be done to remedy this unhappy condition.

Two plans occur to me as worthy of trial, one by the owner and the other by the community.

When it is desired to protect the fish in a stream or the fruit in an orchard the owner posts a conspicuous notice to forbid trespassing. Let him do the same on his forest-property. Some kinds of trespass, such as the pasturing of cattle in open and mountain woodlands, can be easily controlled; some, such as hunting, berry-picking and the like, not so easily; but the moral effect will be the same in all, and it will make prominent the fact that the owner has some care for and interest in his own. Such notices if prepared in large quantity could be made cheap and durable, and placed where they would command attention. Can our forestry associations, agricultural and other organizations render any more effective service for the cause than to agitate this matter, and urge our farmers and land owners to undertake it; or even to prepare and furnish such notices at a nominal price to all who will agree to use them? Much that is technically trespassing is not injurious, but this distinction could be safely left to the owner, as are many other matters. What is needed is a public sentiment which shall look upon forest-property, in any state and condition, as in no respect different from any other kind of property, and which shall secure for it the same immunity from injury. If nothing is done such a sentiment may come at last, but it will come very slowly. By some such means as has been suggested may we not hasten it?

Undoubtedly the prevention of forest-fires is of prime importance, and our chief effort should be toward that end; but when fires are kindled, as they will be under the most careful supervision, how can we control and suppress them?

The same apathetic condition of both the owner and the community is to be faced here as in the case of trespass. The fire is left to burn until it has passed beyond control, and it stops only when everything inflammable within its reach has been consumed. Disgraceful examples of the truth of these statements are so common that they form a staple part of our daily news. To have an adequate sense of the injury done by these conflagrations one must have a knowledge of the indirect as well as the direct value of forests, and must bear in mind also the relatively long time required to produce a forest-growth. Were proper attention given to the matter we should be so keenly alive to the value of forests that fire or any other agency which threatened to destroy them would be as quickly and vigorously combated as if some monumental building were exposed to destruction.

Forest-guards are charged with this duty of protection in other countries and we have no officers corresponding to them. But why may we not add to the duties of some existing township officers, say the supervisors or constables, the oversight and control of all fires, accidental or other, on farming and forest-land? There would then be some responsible head for each district, who would have power to summon help, to give or refuse permits for burning clearings and the like, and who should receive reasonable compensation for these special duties. An innovation like this, although so small and at the same time so well warranted, might still meet objection, it is true, but the same difficulty would probably appear if any other plan were devised.

The forestry question, from every point of view, is subject to the same economic laws as any other, and its advocates should be able to point out practicable methods for its solution.

The same conditions which are slowly but surely changing our methods of agriculture are opening the way to and making possible a rational forest-practice. We cannot too quickly or thoroughly consider what shall be its methods.

State College, Pa.

W. A. Buckhout.

Correspondence.

The Effect of Seasons on Vegetation.

To the Editor of GARDEN AND FOREST:

Sir.—Too much care cannot be taken in judging of the character of trees, shrubs or fruits by their behavior during 1890. The season is so far abnormal in every sense. Strawberries, for instance, have not developed one of their real characteristics in my beds, Crystal City, Summit and Sharpless alone excepted. Haverland, which really is a very large berry, showed fruit only medium-sized and without flavor. Sweet berries turned up sour, and nearly everything had a touch of bitterness. In fact, symptoms of unfertilized fruit were general. I should not have known Bubach in boxes; and Bomba turned out better than its real character. I have seen no really perfect strawberries in size, flavor and color, although I had one-third of a crop and many large berries. But had I desired to impart to any one knowledge of the real quality of any berry I should not have done it by offering him samples of this year's bearing. For this reason I regret to see reports of berries made at all this year. My Pearls and Sharpless and Bubachs when mixed I could not have separated with certainty, although another year nothing would be easier.

The effect of season is very peculiar in other ways. One summer ten or twelve years ago there was an unusual tendency to produce variegations in foliage. This, no doubt, had something to do with the effect of the solar beams on chlorophyll in spring. I regret that I have no meteorological data of the year. But I noted among my own finds a variegated Quince-bush, variegated Silver Poplar, variegated Apple, and many more. None of them endured July heat except the Poplar. This I unfortunately lost by the open winter following. It was heaved out by the frost.

I am confident that we have before us a vast field for investigation in a comparative study of different years on foliage, fruit and flowers. In 1889 I noted here a marked tendency among double flowers to show fewer petals than usual. To determine the real character of a fruit or flower requires a comparative test. Grapes particularly appear very abnormal at times. If any one were to pass through my vineyard on two successive seasons I am quite confident I could get from him exactly opposite comments concerning Grapes, especially Rogers' Hybrids. Here is a class of Grapes sensitive beyond measure to the year's special characteristics. Number 30 is at times equal to a fine hot-house variety; then again it is flavorless. Lindley one year cannot be surpassed, while the next it is inferior. To discard the variable sorts would reduce our list very greatly. Even Worden in 1889 was of poor quality over a large part of the country.

Clinton, N. Y.

E. P. Powell.

Shaftesbury as a Tree-Planter.

To the Editor of GARDEN AND FOREST:

Sir.—In Traill's Life of Shaftesbury, published by Appleton in 1886, on page 104, is the following interesting passage on tree-planting: "In the very thick of the tangle of intrigues, rivalries and cross-purposes in which the cabal were involved during the year which elapsed between the conclusion of the second Treaty of Dover and the reassembling of Parliament in 1672, we find him [Shaftesbury] addressing a long letter to his bailiff, containing the most minute instructions for the planting of several varieties of the best cider Apples, to wit, 'the Red-streak, the Black Apple, the Streak Must, the Sour Pippin, the Bramsbury Crab, the Grouting.' Further he goes on to inform 'Hughes' (who, no doubt, was intimately convinced of his knowing much more about it himself than the authority quoted by my lord) that the best planting of timber-trees is 'with nuts, acorns, seeds and footsets, and not with young trees removed; and in that manner of planting where the ground is dry, he never plants on little hills, banks or ridges, but sows and sets them on the plain ground, having first made it with several plowings and diggings very light and fine, which should be begun about September, that the frost might season the earth against the spring, when you plant. When this is done the roopworm is killed and will not annoy the plants. He useth constantly' (does this experienced gentleman by whose

woodcraft Hughes is being put to shame), 'in setting of chesnuts, acorns and seeds, to steep them twenty-four hours in milk, which gives them a great advantage; he sets his seeds and plants five feet one from another, and sets the two first years among them beans, which not only pays his charge, but, as he affirms, extremely cherisheth the plants. He waters his plantation the two first years only. . . . He plants an abundance of the best sort of Filberts among his plantations of timber. I would have you do the same amongst mine. He assures me that if I plant Siccamos near my gardens they will spoil all my fruit with the flies they breed. Therefore pray pluck up all the Siccamos that are in the dry meadow behind my kitchen garden, and in the room of every one of them plant a Chesnut, a Walnut or a Honey-broke Oak.'" J. N. B.

Brooklyn.

Tecoma grandiflora.

To the Editor of GARDEN AND FOREST:

Sir.—I am glad that you called attention to the merits of *Tecoma grandiflora* in last week's paper. Perhaps the reason that this fine old plant has not been more generally used is found in the fact that it is sometimes rather tender when young, but if it can be protected until the main stem is some years old by straw matting during the winter it will be found perfectly hardy, and no plant at this season can show an equally beautiful bloom. A plant by my house is probably thirty years old, and its main stem is as large as a man's arm. I have just counted twelve open flowers on one of the immense panicles, with twelve buds yet to open. Since these flowers are borne on the wood of the year hard cutting back will increase the abundance of its bloom. When tied to a stake for a time its stem will become self-supporting to a height of four or five feet, and from early August until hard frost the plant will make a conspicuous and elegant appearance. I think that some large-flowered forms of *T. radicans* have been occasionally called *T. grandiflora*, but the distinction between the plants will be evident to any one who examines them.

Flushing, L. I.

S. B. Parsons.

Sargentia Greggii.

To the Editor of GARDEN AND FOREST:

Sir.—Since writing of this plant (page 362) I have found it in mountain cañons about the Pass of San José (Villar Station, on the Tampico branch of the Mexican Central Railroad), attaining the average size of trees, fully fifteen inches in diameter. Here at last it was seen in full bloom, its bright green foliage half hidden by close panicles of white flowers three to six inches high, a beautiful tree indeed.

Associated with it in these mountains was found, as I was convinced, another species of this new genus, a large shrub, with leaves mostly simple, pubescent and olive-green in color (those of *Sargentia Greggii* being trifoliate and smooth), and small clusters of flowers scarcely paniculate.

San Luis Potosí, Mexico.

C. G. Pringle.

Recent Publications.

A Manual of Orchidaceous Plants.—Part VI. *Cælogyne*, *Epidendrum*, etc. Messrs. James Veitch & Sons, Chelsea.

The sixth part of this useful work, which has recently appeared, is devoted to the genera *Cælogyne*, *Epidendrum*, *Spathoglottis*, *Phajus*, *Thunia*, *Chysis*, *Calanthe* and a few others, or such of the species as are usually found in cultivation. It extends over 134 pages and contains about forty excellent wood-cuts. It is treated in the same excellent and comprehensive manner as in previous issues—details of the history, introduction and cultural requirements of the different species being given, also their geographical distribution, synonymy and references to original descriptions and figures, all of which enhance the value of the work.

In those genera from which hybrids have been raised we find an enumeration and description of the several kinds given after that of the species. The notes and illustrations under this head are particularly interesting, and include the genera *Calanthe*, *Chysis*, *Epidendrum*, *Phajus* and *Thunia*, also the curious bigener raised between *Phajus* and *Calanthe*, to which the name *Phaio-Calanthe* × has been given. In the case of *Calanthe* these hybrids are becoming rather numerous, and seem likely to become more so, for the facility with which they can be produced, and their comparative precocity in flowering, as well as their beauty, all contribute to the interest attending the raising of them.

Of the work generally it is enough to say that it fully maintains its high standard of excellence, and from the long experience which the authors have had in the management of this interesting family, there can be little doubt it will prove invaluable to cultivators generally. The succeeding part is to include *Phalenopsis*, *Ærides*, *Vanda* and the allied genera, according to announcement, and will doubtless prove exceptionally interesting.

Notes.

A monument is to be erected in Salisbury Cathedral to the memory of Richard Jefferies.

A statue of Linnaeus is to be given to the City of Chicago by its Swedish residents, and will be placed in Lincoln Park.

"Ten-thousand-times-sprinkled-with-gold" is one of the poetic names which the Japanese are fond of bestowing upon their *Chrysanthemums*.

A catalogue of his collection of Orchids, recently distributed by Mr. Van Imschoot, an amateur of Mont St. Amand, Belgium, with the view to facilitating exchanges between himself and other amateurs, contains the names of about 800 species and varieties.

The Superintendent of the Public Gardens at Launceston, Tasmania, writing to *The Garden*, says: "All our *Chrysanthemums* are grown out-of-doors in the open garden; the climate here suits them admirably. . . . Mrs. Alpheus Hardy has just flowered here and is attracting a good deal of attention."

Foreign journals note with approval that the Prefect of Savoye has forbidden the gathering of *Cyclamen Europæum* in the woods of his province, the beautiful plant being threatened with extermination by collectors who annually send it in enormous quantities to the markets of Chambéry and Aix-les-Bains.

At Gooseberry shows in Warwickshire prizes are given for single berries, and the first premium this year in Faleshill, near Coventry, was taken with a red berry weighing an ounce and a quarter, and looking, as *The Fruit Trade Journal* reports, more like a plum than a gooseberry. No exhibits were admitted to this class which did not weigh an ounce or more.

At the recent great horticultural exhibition in Berlin, visitors were asked to record their opinions as to which was the most beautiful *Rhododendron* shown. The favorite proved to be the rosy lilac *Everestianum*, so deservedly popular in this country, for which 12,800 votes were cast, while a variety called *Limbatum*, having white flowers with a crimson edge, came next, and *Viola* third on the list.

An example of the way in which plants seek for nourishment in sterile situations was noticed recently by a correspondent of an English journal, writing from Florida, who says that under groves of dwarf Oaks, where the soil is too poor to bear grass, *Cacti* (*Opuntias*) may be found which, although not rising more than six inches above the ground, have roots that extend eight or ten feet horizontally just beneath its surface.

The highest mountain in the Hartz range, the Brocken, so intimately connected with legends of the Devil and his cohorts, is to be brought into line with the world's general tendency toward scientific rather than superstitious thought. A botanic garden is to be established there, under the control of the Director of the Botanical Garden at Göttingen, for the purpose of cultivating the plants indigenous to the mountain itself and to other lofty places in the neighborhood.

A correspondent of the *American Florist* says that while in 1874 there were but thirty-three florists in San Francisco there are now seventy-two, and that "all over the state the same proportionate development is manifest. The improvement in public taste," he adds, "during the past five years is still more clearly marked; quality is more desired and better prices are paid. The Daffodil, for instance, then very rare, has become the prime favorite for a spring flower, and the California wild flowers, which no florist kept for sale five years ago, now fill large windows on the principal streets."

Many writers in foreign journals are just now calling attention to the great value of the Locust (*Robinia Pseudacacia*) for planting in situations where it is desired to prevent the shifting of loose soil. One example cited is of very large plantations recently made in Roumania along the borders of the Danube upon banks of sand. "Thanks to the excellent character of the tree," says the *Revue Horticole*, "which will grow almost anywhere, these plantations have succeeded very well, and

they have the double advantage of solidifying the shifting dunes and of furnishing an excellent wood, while utilizing surfaces which hitherto had been wholly unproductive."

In an address before the Columbus, Ohio, Horticultural Society, Professor W. J. Green said that it was now easier to grow Plums and Pears than formerly, and of late these fruits have been among the most profitable fruit crops. In planting, a heavy, tenacious, wet soil should especially be avoided. No manure should be applied to Pear-trees. They will not stand forcing, as blight sets in when they grow too rapidly. A steady, slow growth is safest. Only a few varieties should be planted as dwarfs, and in general it is better to plant standards. The only safe dwarfs are Clapp's Favorite and Duchess d'Angouleme. These are also good as standards.

At a recent meeting of the California Academy of Sciences, Doctor Gustav Eisen spoke of the Sequoia forests in Tulare County, which have lately been surrendered to lumbermen by the Land Department. Doctor Eisen says that the destruction has begun in earnest already. On the Tule River he examined the stump of one tree which was forty-one and a half feet in diameter. These trees are so conspicuous as individuals that each one has a name of its own. The one mentioned above was called "Philadelphia," another is called the Centennial, and a third, known as the "California Stump," is thirty-three feet in diameter, and 60,000 shakes were made from the tree. After Doctor Eisen had explained the shamefully wasteful methods of lumbering in these forests a committee was appointed to memorialize Congress for the protection of the only remaining grove of these giant trees.

Mr. Horsford's mention of *Sabbatia chloroides* recalls the fact that great masses of this beautiful wild flower often form a conspicuous feature of the August exhibitions of the Massachusetts Horticultural Society, and it is sometimes offered for sale by the florists of Boston. At the summer resorts along the New Jersey coast great quantities are brought in by boys from the moist, sandy barrens, where it grows in great abundance, and a ready market is found for it. A mass of these delicate pink flowers loosely set in a vase is very ornamental. The flowers remain in good condition long after being cut and the unexpanded flower buds continue to open for many days. The delightful fragrance of the *Sabbatia* gives it an additional charm, and it is no wonder that large and increasing orders for the seed of this plant are coming over from Europe every year.

The Crescent has hitherto been considered the best market Strawberry in central Ohio, but the comparatively new varieties, Bubach, Haverland and Warfield, are all so good that it is difficult to determine which of the four deserves the precedence. At the Ohio Experiment Station they easily excel all other varieties in productiveness, and they all have imperfect or pistillate flowers. "And why should we not expect this?" asks Dr. Lazenby, in *The Country Gentleman*. "The production of pollen is an exhaustive process. If the vital energies of the plant are expended in this way, certainly we cannot expect as good a result in developed fruit as we can where no pollen is produced. We must remember, however, that in order to get the best results, these imperfect varieties must be well fertilized. Whether it is better to use a productive perfect variety as a fertilizer, or to use one known to produce a large quantity of pollen, and that at the right time, without reference to its fruit, is an open question."

We have received by mail from Mr. P. J. Berckmans, of Augusta, Georgia, a flowering branch of *Leucophyllum Texanum* a shrub which has rarely if ever been seen here in cultivation. Mr. Berckmans writes that he tried for years to propagate this species with living plants, cuttings and seeds; but he never succeeded until some five years ago, when two plants were started. These are now four feet high, and with their ashy white foliage and abundant purple flowers, they are very conspicuous. They endure the warmest and driest weather well, since their large roots penetrate the soil to a great depth. The foliage, which is evergreen in its native habitat, stands without injury a temperature which does not fall below fifteen degrees Fahrenheit, and these plants have lived through a freeze of five degrees above zero. In writing of the forest-vegetation of the Lower Rio Grande Valley, Mr. C. G. Pringle speaks of this plant (see vol. ii., p. 394) as the most striking shrub of the region, and calls it "surpassingly lovely, with a profusion of purplish bloom surmounting the velvety white foliage." No doubt it will prove a great addition to our list of shrubs for latitudes south of Washington, and it may survive winters much farther north if slight protection is given to it.

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Growth in Thought Relating to Forestry Matters.

THE principal gain in relation to matters connected with forestry and the preservation of scenery in this country in the last two or three years is probably the increasing definiteness of thought regarding them. More persons comprehend the truth that if anything is to be accomplished in the way of improvement in the condition of these interests much work will be required, and some money must be expended. There are new organizations and activities for the promotion of such objects in this state, in Massachusetts, New Hampshire and Maine, and their influence, in conjunction with the increasing discussion of these subjects by the press of the country, has led to a perceptible advance in public thought. There is increased clearness, definiteness and sobriety, and less hazy enthusiasm and fantastic talk. The new temper is more favorable to action than the old, although there is still room for much improvement in all these respects.

Meetings, addresses and essays have their place and are often highly useful, though more is usually expected from them than they are really suited to accomplish. They are good only if they lead to something beyond themselves, to intelligent and systematic endeavor to change the condition of the public mind and the course of public action in relation to the particular matter which requires improvement. Unless orderly and persistent work of this kind is contemplated, and is actually provided for and taken up in action adapted to bring in a new order of things, it would often be better not to start a new movement or publish resolutions setting forth the plan of a great reform. An abortive beginning of this kind makes all subsequent effort for similar objects more difficult, and the effect is depressing and injurious in proportion to the attention and expectation which have been awakened.

Enthusiasm is a good thing in such matters if it is of the enduring kind which sustains a man in a long course of effort to arouse public interest and enlighten and direct public sentiment. In every attempt to bring about an

advance in matters pertaining to forestry interests in this country, or to scenery and public out-of-door possessions and opportunities, the greater part of the work, and much the most difficult part, is that of interesting and engaging the people in support of the proposed measures of improvement. The question of means and methods for the diffusion of knowledge and the propagation of ideas is what chiefly requires attention. The difficulty of work of this kind, and the amount of it which will be necessary, are nearly always underrated by those who plan new movements. In many instances this part of the work seems to be left out of sight altogether, and its necessity is not recognized. Apparently, it is expected that the existing order of things will be entirely changed by the adoption of resolutions and the election of a board of officers.

But the best possible beginning avails little unless it is followed by a new course of action. If anything valuable is to be accomplished new centres of energy must be established and new activities must be set up. To bring about any considerable improvement in the situation of the interests connected with the forests or with scenery, in any of the states of this country, much conference and correspondence would be required in order to bring the people who are interested in such objects into relation with each other, and thus render effective co-operation possible. It is important in any effort of the kind not to undertake too much at first. After a definite purpose is outlined which can be commended to the public as moderate, reasonable and desirable, the main idea must be developed, patiently and clearly, and its relations to existing conditions and interests fully set forth. Few persons will attend or heed at first, and prejudices and prepossessions of all kinds have to be overcome. It requires time and much iteration of impressions to change habits of thought and action. There is little chance for the success of such undertakings unless obstacles which are certain to be encountered are recognized at the beginning. Any successful enterprise of the kind must have a business basis, and business methods must be followed so far as to provide for necessary expenditures. But many persons think themselves deeply interested in local movements for the preservation of scenery and in similar objects who never really assist in any effective way. They never reach the stage of serious or definite thinking in regard to the matter. The movements for the preservation of scenery in various states of this country afford opportunities for valuable service to the general welfare which should be most welcome to men of public spirit.

A year ago Mr. William McMillan, Superintendent of Parks in Buffalo, read a paper before the Society of American Florists, in which he argued in favor of the natural treatment of grounds which are large enough to have a distinctive landscape character as opposed to what is known as decorative treatment. That is, beds of bright colored plants were spoken of as altogether out of keeping with a picture of pastoral simplicity. Mr. McMillan pursued his argument with some raillery against staring contrasts and loud colors and the use of trees and plants with constitutional deformities instead of a more moral, quiet and delicate style of art. It was said that if the opportunity had been given to reply to Mr. McMillan his position would have been criticised by many members of the Convention, and, therefore, at one of the sessions of the Association in Boston last week the question was again brought forward with the avowed purpose of continuing the discussion. It would naturally be supposed that members of a calling whose business is primarily with flowers would favor the use of material with which they are most familiar—that is, that they would insist upon the splendors of color which can be furnished by conspicuous flower beds as an essential feature of planting. But, in truth, it seemed that the majority rather preferred the kind of art which Mr. McMillan advocated.

The fact is that the florists of the country have been doing a great deal in the way of introducing more simple and quiet arrangements. Even in cut-flower decorations the stiff and formal designs of a few years ago have been superseded by more natural grouping and more delicate shading in the colors used. Perhaps there is no real conflict between the two schools so-called, and that there is no reason why each one should not appreciate the value of the other. The statement made by Mr. Manning, of Brookline, that we must recognize two distinct arts to which the name of gardening is applied, seemed to be generally accepted. Landscape gardening deals more with the fundamental and permanent features of scenery, while decorative gardening is confined to more contracted spaces where the treatment may be highly ornamental and modified every year. Neither one of these should be adopted to the exclusion of the other, and the real question is, under what conditions landscape gardening proper is to be preferred to decorative gardening, or how far the two can be used together without conflicting so that each one would detract from the value of the other.

It will hardly be disputed that formal beds of flowers can be placed so as to disturb the quiet and unity of a meadow, and that on the other hand a stretch of green sward with its irregular border of shrubs and trees would be an inappropriate setting for a brilliant piece of carpet bedding. The fields for the exercise of good work in both directions are sufficiently numerous. There is abundant room for formal planting in connection with architectural terraces and monumental buildings, and there is no reason why persons who appreciate good work of this sort cannot relish also the broad and park-like treatment of larger public grounds. The discussion was interesting because it proved that every year there is a larger number of people who take correct views of the principles upon which both kinds of gardening should be based.

The Sacred Olive-Tree of Blidah.

A PORTRAIT of the Olive-tree in the Garden of Gethsemane was published in one of the early numbers of GARDEN AND FOREST (i., page 284). Less widely known and less interesting, certainly, to the peoples of western nations, are the sacred Olive-trees of Blidah, one of which appears in our illustration on page 419, although these trees have long been revered by the inhabitants of Algeria, and are familiar to travelers in that country. The sacred grove, of which our tree is one of the largest individuals, was planted, so goes the story, by the hand of a famous Marabout, who prophesied the destruction of this modern Nineveh, in the days when Blidah was known as the "wicked city," from the depravity of the rich Arabs who flocked to it to pass the summer months. The prophecy came true, for an earthquake, which lasted during four days, destroyed in 1825 the lives of 7,000 of the inhabitants of Blidah, but spared the sacred grove and the tomb of the prophet, Mohammed-el-Kebir, which it shades.

Our illustration is from an Algerian photograph placed at our disposal by Mr. Francis Skinner, of Boston.

The Arboretum of Dr. Dieck at Zoeschen.

AT the ancient Saxon city of Merseburg, built by the Emperor Henry the Fowler, one is truly in the heart of central Germany. Immense plains, unfolding themselves toward the distant hills which to west and north border the horizon with a line of blue, a rich alluvial soil traversed by the Saale and its tributaries, a whole province where spontaneous vegetation has, so to say, disappeared beneath an overlay of infinitely careful cultivation—this is the aspect of the country through which we pass on our way toward Zoeschen. Towns and villages solidly built of hewn stone breathe of comfort and give themselves the air of a German Goshen; they swarm with a well dressed population and bear the seal of an ancient civilization.

"Here is Zoeschen," says the driver, and we traverse the village, which is more exactly a little town, pretty and cleanly; and, at the end of a short street, diversified by rural-looking gardens, we enter a verdurous avenue that, making a turn, carries us along a bridge over a brook whose troubled waters

show the effect of this eminently rainy summer. Another turn among great trees, dominated by an enormous Canada Poplar, and the carriage stops before the entrance of a fine modern villa, where Dr. Dieck is standing to offer us the hospitality of his estate.

This oasis of arboriculture, in the midst of the prose of endless fields of grain, is of recent origin. It does not impress us by means of ancient trees or of magnificent perspectives losing themselves in great forests. All these there are, but in the distance. What Dr. Dieck calls the "National German Arboretum" exists as yet only in an embryonic state, although conceived on a grand scale. It has been laid out over an area of six hectares, at a half hour's distance from the house and the park, on low grounds rather too subject to the inundations of the little River Lupa, a tributary of the Saale. The trees and shrubs have been planted recently in groups, at well judged distances from each other and with regard to the natural families to which they belong. Several unfavorable seasons have but too greatly retarded their development and left wide gaps which must be refilled. Everything that the catalogues offered in the way of old acquaintances and of novelties beginning to be somewhat known has been confided to the soil, and it is proposed to add without delay the whole assortment contained in the nurseries of Zoeschen, a truly astonishing quantity. No difficulties daunt the proprietor. After three consecutive years of the most discouraging sort, he has just enriched the Arboretum with 300 new species or forms which are not mentioned in any catalogue, even his own. An old tile-factory, which adjoins the plantations, is about to be renovated, and will serve as a botanical and silvicultural laboratory.

But, after all, the Arboretum is not the greatest glory of the Zoeschen establishment, for, however grandly prepared, it is as yet a work of the future, counting for little at the present moment. While the Arboretum at Muskau, founded with such fair hopes by Petzhold, is sadly dying on its sandy hill, that at Zoeschen is but just emerging from the dampness of its alluvial soil. A future generation will admire it, but what impresses us to-day is the greatness of the idea conceived by its founder.

Present interest centres chiefly in the nurseries, which surpass those of Angers, and already rival those of Herr Spaeth, near Berlin, and which include a vast collection of species, forming an extraordinary collection of novelties, some of which are of almost fabulous rarity. Dr. Dieck has a rare energy and an inborn passion for the works of nature. He travels widely and himself collects plants, seeds and insects; where he cannot go in person he sends his agents, and he perpetually animates the pen and the industry of innumerable correspondents in fulfilling his mission to disseminate the vegetable species of the whole globe and enrich the flora of his fatherland. The word impossible does not exist for him when rare plants are to be won from foreign countries. A mere private citizen, he has established solely for his own use eight stations through central Asia from the Caucasus to the Japanese island of Yezo and into the depths of Siberia, with a branch toward the west embracing Bulgaria, Asia Minor and Mount Lebanon.

His nurseries now cover a space of 100 acres, which will soon be increased to 125 acres, as large an area as can be kept in good order. The great mass of the plantations extend beyond the Arboretum, stretching toward a vast and magnificent forest of Oaks and Lindens, Ashes and Maples, which is called "The Great Wood," and which reaches nearly to Leipsic, along the course of several little rivers. Here are great plantations of forest and avenue trees; there conifers brave a climate which is unfavorable for them, often under the protection of shutters and rushes. It is worthy of remark that the German Fir (*Abies pectinata*), the natural area of which extends as far as Lithuania, freezes here, and that the Douglas Spruce does very poorly, while certain species reputed tender seem, on the contrary, entirely hardy.

The seedling-beds of Zoeschen, which make the most astonishing feature of the place, occupy an immense space back of the park proper. A great enclosure protects them, as is likewise the case with the conifers. Here one finds also the *plantes de la terre de bruyère* of the Rhododendron class, Azaleas, Kalmias, Ilexes and other broad-leaved evergreen shrubs. It is not too much to say that this last class contains marvels, as, for example, among those most recently introduced, *Rhododendron Ungerii*, from the Caucasus, with brilliant foliage silvered beneath; *Phillyrea Vilmoriniana*, from the mountains of Pontus; *Bruckenthalia spiculiflora*, from the Bythinian Olympus; *Quercus alnifolia*, from Cyprus, which might better be called *Q. camelliaefolia*; *Eleutherococcus*, from the Amour

River; *Magnolia hypoleuca* and *M. parviflora*, the Japanese Stuartia, and many more, including innumerable *Vacciniums* and other *Ericaceæ*, which are difficult to cultivate, and which have been chiefly furnished by America.

The number of wild Roses, species or varieties, is simply startling, and of especial importance in this department are the Oil Roses. To Dr. Dieck is due the credit of having wrested the monopoly of their culture from Bulgaria. Here the queen of flowers is brought down to the level of prosaic vegetables, and cultivated not in the privacy of gardens, but side by side with Cabbages and Carrots. This new branch of agriculture seems to have a prosperous future. The product—that is, the odoriferous petals—can be advantageously sold to several large manufactories of perfumes in Leipsic. It is especially Herr Scheele, of Schadebach, near Zoeschen, who has taken in hand this new enterprise, which demands a very fertile soil or one strongly enriched and deeply trenched. He has planted vast fields, which look like vineyards, with the oil-producing Roses of the Balkan, among which *Rosa trigintipetala* seems to promise best, in spite of the attacks of a certain fungus. These Rose plantations are kept with wonderful neatness, and one seeks in vain within them for the tiniest weed. They yield annually a net return of \$300 an acre, surely no mean profit. Dr. Dieck proposes to study thoroughly the Rose of Schiras, which will probably prove to be *R. moschata*, and the attar of which, he says, is the most precious of all, though as yet unknown outside of Persia.

It is surprising to see the way in which certain newly introduced American plants are growing at Zoeschen. In this respect nothing surpasses the development of *Alnus rhombifolia* and *Betula occidentalis*, natives of British Columbia—nine feet in two years and five months from sowing!

The park at Zoeschen, although not old and for the most part planted by Dr. Dieck himself, nevertheless possesses some very fine trees even, as might be expected, among very rare species. The Sophora and the Ailanthus prosper, and the Liquidambar does very well. I also remarked on a lawn near a bit of water a superb group of *Glyptostrobus*, that curious Chinese representative of the American Bald Cypress. These specimens are grafted on *Taxodium*; but this does not detract from their appearance. Furthermore, one admires here a Japanese Walnut (*Juglans Sieboldiana*) of the finest expression, and differing much in its foliage from *J. Mandschurica*. A little known Rhamnus, of the *Frangula* group (*R. sempervirens*), here extends its large masses of foliage, which resist the cold until Christmas. I noted *Cornus alternifolia* in the form of a little tree, which spreads its branches in the most striking way; and here I saw for the first time *Aralia spinosa* and *Panax sessilifolium* in full fruit.

But, caring even more for great trees than for rare ones, what charmed me most was a giant *Robinia Pseudacacia*, that terminates and dominates the large lawn facing the house.

Berlin.

Carl Bolle.

[It would appear that many plants from Japan, which are comparatively rare in European gardens, have been grown for years in America. Taking those named at the head of this column for example: A specimen of *Magnolia hypoleuca*, twenty-five years old, stands within the limit of this city, while *M. parviflora* and the Stuartia have been known for years in our suburban gardens.—Ed.]

Notes on the Mexican Water Lilies.

NATURE, lavish of her gifts in tropical climes, has sown in Mexican waters a larger and more pleasing variety of the flower dedicated to the water nymphs of ancient mythology than is found in our northern lakes. The species, as far as known to me, are four: *Nymphaea Mexicana*, Zucc., with yellow flowers, *N. elegans*, Hook., blue flowered, and *N. ampla*, DC., and *N. gracilis*, Zucc., with white flowers. The range of distribution of all of these, with one exception, extends within the present limits of the United States—*N. ampla*, *N. elegans* and *N. Mexicana* being known to occur in southern Texas, and the latter, if, as is strongly suspected, this species is identical with *N. flava*, in Florida also.

N. Mexicana I have traced from the lagoons of the lower Rio Grande southward to the lakes of the valley of Mexico, and westward to the slow streams of the great valley of the Lerma, in the state of Jalisco. Its leaves are six or seven inches broad on their upper surface, which is dark green and shining, sparingly splashed with purple, exactly in the way of the Florida plant; its flowers, two or three inches broad, are borne on erect stems eight to twelve inches above the leaves lying on the surface of the water, or rising out of the water when

crowded; their sepals and petals are acutish, the former being purple without, but inward blending with yellow, and the petals, as also the stamens, lemon-yellow. Its rhizome is scarcely more than an inch in thickness and only a few inches in length. A striking peculiarity of this species is its multiplication by means of runners, just in the way of the Strawberry. Young plants are thus freely sent out from the rhizomes of plants formed in this way the previous year, and from the young plants themselves very often, being borne on white spongy cords half an inch thick and one or two feet long. These young plants usually flower after a few weeks, while yet attached to the parent plants. Thus the flowering of the species is prolonged from June till October.

Pleasant are memories of fields of this plant, deep green enlivened by abundant yellow blooms, seen by me in valleys lying under serene golden skies and rimmed by blue sierras.

N. elegans I take to be a denizen of the warm lowlands only, ranging from the Waco River, in Texas, southward through the Mexican Gulf state of Tamaulipas to that of Vera Cruz, at least, perhaps much farther. In the shallower lagoons of the lower Rio Grande—former channels of the river, now tortuous lakes, isolated throughout most of the year from the river's flow—it is so abundant as to cover large expanses of water.

In the size of its leaves and in the size and shape of its flowers this species is similar to the preceding, but the flower-stem is perhaps taller and more slender. The outside of the sepals is green, marked with fine broken lines of purple; the petals are of various shades of blue, while the centre of the flower, the stamens and stigma, is pale yellow. Its rhizome is as small as that of *N. Mexicana*, and it is propagated only, I think, by means of seed. Unlike those of the species just mentioned, these are very numerous and very small.

I well remember my delight when first I came upon a lake covered with this plant, whose flowers were opening in the sunshine of the morning and seemed a reflection of the blue vault bending over them.

The habitat of *Nymphaea ampla*, as well as I can judge, is more restricted. Certainly I have only met with it on or near the table-land of northern Mexico in springs here and there or in the limpid streams flowing from them. The striking peculiarity of this species, among those which are native to America, is indicated by its specific name, its leaves being a foot or more in breadth. These are purple beneath, with prominent veins. The Mexican name of such Lily-pads is *lampazos*, and they have given name to a town on the line of the Mexican National in Nuevo Leon, whose *raison d'être* upon desert mesas is a vast spring occupied by this species, and probably to a Texan town also. The flower of this species is scarcely larger than that of the preceding; its petals being white; the rhizome is somewhat thicker and longer.

Nymphaea gracilis I only know in the region drained by the Lerma, yet this is a wide region, extending from Aguas Calientes and San Luis Potosi on the north to near the City of Mexico on the east and south and to beyond Guadalajara on the west. It is the fertile and populous heart of Mexico, the region of frequent large cities and of green garden lands.

As the train of the National Railroad nears the mountain rim of the green valley of Mexico you see this Water Lily whitening the surface of the fountain lake of the Lerma, newborn from the snows of the Volcano of Toluca; and it is to be found in lakes, natural and artificial, and sluggish streams tributary to this great river far and near. Sometimes it yields place in these waters to *N. Mexicana*; but it seems to be the more common species here. The tall and slender flower-stalk rising a foot above the water, and the rather narrow and acute petals, give this plant the slender appearance indicated by its specific name. Of the several species under consideration, this one alone, as I believe, possesses any marked fragrance. Its root-stock is a tuber rather than a rhizome—or such, at least, it appears in autumn, after all the rest of the plant has perished—an ovoid body one to three inches in length, with thick and hard outer shell, covered with bosses quite like a Pine cone in appearance. In this state the plant is prepared to hibernate and endure safely the droughts of the earlier months of the year, when many of the shallow lakes which it inhabits are dried up, and the land, where they lie tumbling about on the surface, is even growing a crop of Wheat.

This strange habit of the plant would seem to favor the success of its cultivation, for its season of growth is but a few months, and when they are matured the tubers can be stored dry as well as potatoes.

Thus, as we see, two white Water Lilies, a yellow one and a blue one gladden the eyes of the botanical traveler in these interesting regions.

San Luis Potosi.

C. G. Pringle.

Plant Note.

Pyrus arbutifolia.

THE two forms of the Choke-berry usually referred to *Pyrus arbutifolia* as varieties have been growing side by side in the Arnold Arboretum for a number of years, and display characters here which seem to make it desirable to regard them as specifically distinct. One of these plants, which must be considered the type of the species as usually limited, is reproduced in our illustration on page 417. It is the plant which Linnæus described in the "Species Plantarum" as *Mespilus arbutifolia*, and which appears to have been one of the earliest North American plants known to European botanists, as it was described by Breyne in his *Prodromus* of the rare plants cultivated in the gardens of Holland, published in 1678. Paul Hermann included it in his catalogue of the Leyden Garden, supplementing his descriptive phrase* by an excellent figure which exactly reproduces the plant of our illustration; and it was described again by Plukenet in the "Almagestum Botanicum," published in London in 1696†. Linnæus quotes the figure of Hermann after his descriptive phrase in the "Hortus Cliffortianus" "*Mespilus inermis foliis lanceolatis crenulatis*," which forms the basis of his description of *Mespilus arbutifolia* in the "Species Plantarum." It is evident, therefore, that if the species is to be divided, the plant of our illustration must be called *Pyrus arbutifolia*, and the common Black-Fruited Choke-berry, first distinguished as *Mespilus arbutifolia*, variety *nigra*, by Willdenow in his "Species Plantarum" (ii., 1021), published in 1799, *Pyrus nigra*. For Willdenow's work was published four years earlier than the *Flora* of Michaux, where it was first described as *Mespilus arbutifolia*, variety *melanocarpa*. Should it on further investigation be found that the two plants are varieties of one species, then the right name for this variety would be *Pyrus arbutifolia*, var. *nigra*.

Characters which appear to separate these two plants are the nature of the leaves, the flowering period, the size of the fruit, and the time of its ripening and falling.

The leaves of *Pyrus arbutifolia* are usually oblong or sometimes oblanceolate, very acute or acuminate, dull yellow-green on the upper surface and densely covered on the lower with thick, whitish tomentum, which is not deciduous. The flowers open in the Arboretum in the early days of June and the fruit does not ripen until the end of October; it is then globular or pear-shaped, and not more than a quarter of an inch across. It is bright scarlet but not lustrous, and remains on the branches without much change of color after the leaves have fallen and until late into the winter. The plants in the Arboretum have reached a height of three feet, with an upright habit of growth, and present a much less leafy appearance than those of the Black-Fruited Choke-berry.

The leaves of *Pyrus nigra* are broadly obovate, generally quite glabrous on the two surfaces even when young, although sometimes pubescent below even at maturity. They are dark green and lustrous on the upper surface, and often nearly as broad as long. The flowers appear in the Arboretum about the 20th of May, and the fruit ripens early in September. It is depressed-globular, very dark vinous purple or black and lustrous, half an inch across or often more, and falls from the branches as soon as it is ripe. The habit of this plant is denser than that of the scarlet fruited species, and is the more ornamental of the two in foliage. It varies considerably in the size and shape of the fruit, and in the size the plant attains. The form with dark, vinous red fruit usually has leaves which are pubescent on the lower surface, while the glabrous-leaved variety has larger black fruit. The fruit of both forms falls as soon as ripe—a constant and important character. The form of the leaves would not sufficiently separate these two

plants specifically, but the difference in the form and color of the fruit, and especially in the length of time it remains on the branches, is so marked and constant that it is hardly possible to unite them.

Pyrus arbutifolia is less common and apparently less widely distributed than the black-fruited plant, although the two grow together in some parts of New England and southward through the Alleghany Mountains. It is not, however, common in any part of the country which I have visited.

Pyrus arbutifolia is one of the most ornamental and desirable of the hardy shrubs which, in this climate, carry bright colored fruit into the winter, and is worth a place in every garden for this character alone.

Our illustration is from a drawing made by Mr. Faxon from a plant in the Arboretum raised from seeds collected many years ago by Mr. A. H. Curtiss in the mountains of Virginia.

C. S. S.

New Orchids.

EPIPHRONITIS × VEITCHII.—This is a very interesting bigeneric hybrid, raised by Mr. Seden, in the establishment of Messrs. James Veitch & Sons, of Chelsea, between *Sophranitis grandiflora* and *Epidendrum radicans*, the latter being the pollen parent. It is very similar to the last named in general character, though much dwarfer, being at present but nine inches high. The flowers are also deeper in color, and borne four or five on a terminal scape. The generic name is compounded from that of the two parents. The plant was awarded a first-class Certificate and also a Botanical Certificate at a meeting of the Royal Horticultural Society on June 24th last. —*Gardeners' Chronicle*, June 28th, pp. 799, 800; July 5th, p. 20.

LÆLIO-CATTLEYA × EXIMIA.—A handsome hybrid raised by Mr. Seden for Messrs. James Veitch & Sons, between *Cattleya Warneri* and *Lælia purpurata*. The sepals and petals are lilac, of good size and substance, and the lip very large and expanded, rich purple with a lilac margin. It was awarded a first-class Certificate at a meeting of the Royal Horticultural Society on June 24th last. —*Gardeners' Chronicle*, June 28th, p. 800.

LÆLIO-CATTLEYA × CANHAMIA.—Exhibited by Messrs. James Veitch & Sons at a meeting of the Royal Horticultural Society on June 24th last, when it received an award of merit. It is said to be a hybrid raised between *Cattleya Mossia* and *Lælia purpurata* and the reverse cross of *L.-C.* × *Canhamiana*. Sepals and petals pale lilac, almost white, the lip mottled with purple. —*Gardeners' Chronicle*, June 28th, p. 800.

SARCOPODIUM GODSEFFIANUM.—This is very closely allied to *S. Dearei*, otherwise *Bulbophyllum Dearei*, though it is said to differ in habit and in some slight floral details. It was exhibited by Messrs. F. Sander & Co., of St. Albans, at a meeting of the Royal Horticultural Society on June 28th last, when it was awarded a first-class Certificate. —*Gardeners' Chronicle*, June 28th, p. 800.

MOOREA IRRODATA, Rolfe.—A striking novelty, and so distinct that a new genus has been proposed for its reception. It is allied to *Houlletia*, of which it has much the habit, but differs in various details of the lip. The flowers are borne in an erect raceme, the sepals and petals spreading, bright reddish brown, passing into nearly white at the base, thus giving a circle of paler color, which is very striking. The lip is three-lobed—the front lobe long and narrow, the side ones large and rounded, bright straw color, with radiating lines of blackish purple; in fact, it resembles a butterfly attached by its head. It flowered in the Glasnevin Botanic Garden, Dublin, under the charge of Mr. F. W. Moore. —*Gardeners' Chronicle*, July 5th, p. 7.

Kew.

R. A. Rolfe.

Foreign Correspondence.

London Letter.

AN exhibition and conference devoted to Ferns by the Royal Horticultural Society was sufficiently supported in every way to warrant the belief that Ferns are in the ascendant with English horticulturists. Those Ferns which may be grown in the open air in England obtained the greatest share of attention, owing partly to the magnificent collections of them exhibited by the few specialists who have made hardy, and particularly British, Ferns a life-long study, and partly to the general ignorance which prevails with regard to these plants. The

* *Sorbus Virginiana*, *foliis Arbuti*, 51, t.

† *Mespilus Virginiana*, *Arbuti lanato folio*, 248.

exquisite beauty and grace of habit with the endless variety of form which belong to British Ferns, as represented in the best collections, astonish even experienced gardeners, who wonder how it is that such beautiful plants are not more generally grown.

English Ferns in their wild forms are charming, but the hundreds of varieties of them which have been got through cultivation, selection and hybridization are simply marvelous. Crested, crimped, contorted, made to develop characters of the most astonishing divergence from the type, these plants

plants thus bred. On the other hand, Mr. Dreury reckons that spores of any sportive variety will produce a considerable number of widely distinct forms without the aid of cross fertilization. The Kew collection of British and other hardy Ferns contains all the best of the varieties raised by Mr. Lowe and the other specialists named. They are planted together on a large rockery and mound, where they form a most interesting feature of the garden.

Tropical Ferns, also, were exhibited in great numbers, and their merits were discussed by eminently qualified men. The



Fig. 52.—*Pyrus arbutifolia*.—See page 416.

have so altered that it is often difficult to believe that they are mere sports due to the skill of the cultivator. Mr. Lowe, Mr. Dreury, the late Colonel Jones and Mr. Carbonnel appear to have possessed the power of obtaining almost any character they liked from a given Fern. Mr. Lowe attributes all these variations to cross fertilization, and so confident is he that Ferns cross quite freely that he professes to be able to obtain by sowing the spores of six distinct forms together a plant which will possess the combined characters of all the six!

This startling statement was almost too much for the physiological botanists, but Mr. Lowe produced his specimens of

horticultural papers here have since devoted much space to Ferns of all kinds. The result of this "boom" cannot but be to bring Ferns of all kinds into prominent notice. The papers read at the conference and the discussions which followed were devoted to the cultural requirements and distinctive features of the best kinds of Ferns as well as to the botanical relationships of the order. An appeal was made for simpler nomenclature, the necessity for which is seen in such names as *Polystichum angulare*, var. *divisilobum plumosum densum*, the name attached to one of the most beautiful of the hardy Ferns shown.

Ivy-leaved Pelargoniums.—The great improvement recently made in this really useful section of *Pelargonium* by Monsieur Lemoine and others is thoroughly recognized in England, where the finest of the newer seedlings are now amongst the most popular of greenhouse plants. By crossing the old kinds with others Monsieur Lemoine obtained new breaks, which retained the loose habit and ivy-like foliage of the old forms, but instead of the small loose trusses and dull colors of the flowers which characterized them, the new seedlings have trusses as large and colors almost as varied and bright as those of the best of the Zonal section. A few days ago I saw a very fine collection of these new Ivy-leaved kinds at Chiswick, where they are exceptionally well grown, some of the specimens being quite a yard through and bearing scores of large flower trusses. The best of those noted were the following: Abel Carriere, large flowered and bright cerise in color; Bridal Wreath, white, with a few spots of rose; Charles Turner, a rich rosy carmine; De Quaterfages, large, rich red, with a tinge of violet; Madame Crousse, Madame Thibaut, Emile Lemoine, Le Printemps and Isidore Feral; these are all remarkable for the size and substance of their flowers and their clear, attractive colors. If it be true that all the Ivy-leaved *Pelargoniums* known in gardens are the progeny of *P. peltatum*, touched with forms of *P. zonale*, one cannot but wonder at the extraordinary improvement wrought by breeders in this one section of the genus.

Lilium Wallichianum.—The variety *Superbum* of this fine Indian Lily, introduced a year or two ago by Messrs. Hugh Low & Co., is much superior to the type, both in regard to vigor of constitution and the size and beauty of its flowers. It is now flowering at Kew, a bulb which last year had but one stem bearing three stems this year, each with three or four flowers, which are as large as those of the Bermuda Lily (*L. Harrisii*), but creamy white, with the inside of the tube colored canary yellow. This is the plant of which a colored plate recently appeared in *The Garden* under the name of *L. ochroleucum*, a name which used to belong to the species now known as *L. nepalense*. Hitherto *L. Wallichianum* has been known as a refractory garden plant, but the variety, at all events, has so far proved perfectly amenable to cultivation here.

Humea elegans.—A short time ago there appeared in an Australian publication a figure and notice of a form of this plant which in some part of Queensland attained a height of about twenty feet. Seeds of this variety were obtained for Kew, and from them plants were raised which are now ten feet high, and have not yet shown any disposition to bloom. By the side of them are some of the ordinary form of this plant, the two kinds having been grown together from the commencement. The latter are, however, now covered with their elegant plumes, and are nine feet high. There is a marked difference in the foliage of the two kinds, the Australian form having much broader, longer, less acuminate leaves, the base more markedly decurrent, whilst the stem is covered with a thick coat of felt-like white wool. It is possible that this may prove a new species, but whatever it may be it is certainly a very striking plant, and if it can be got to flower under cultivation in England it will be quite sensational.

Rehmannia rupestris.—This is another of Dr. Henry's discoveries in western China, and of which plants raised from seeds taken from dried specimens are now in flower at Kew. The genus *Rehmannia* is composed of about six species, all natives of China and Japan. It is closely related to *Digitalis*, but its appearance suggests *Gesneraceæ* rather than *Scrophularineæ*. One species—namely, *R. glutinosa*, generally known as *R. Chinensis*—has long been known in England as a hardy herbaceous plant. It is figured in the *Botanical Magazine*, t. 3653, and in the last number of the *Gardeners' Chronicle*, from a plant grown in a sunny border at Kew. The new one is about eighteen inches high, the central growth erect, the laterals all drooping. The leaves are large, ovate, fleshy, toothed and thickly covered with silky white hairs, giving the whole plant a silvery appearance. The flowers are not unlike those of the Foxglove in shape, and they are white, tinged with rose; they are produced singly from the axils of the leaves. Grown in pots this plant is pretty enough to please, and should it prove hardy it will be a useful acquisition as a front-row plant for the herbaceous border. Mr. Hemsley, who described this species in his "Index Floræ Sinensis," quotes Dr. Henry's note to the effect that in China this plant is known as Cliff Cabbage, and that it is much esteemed as a medical simple. It is said to grow in almost inaccessible places on the faces of cliffs. At Kew it has grown well planted in a roomy pot in rich soil.

Campanula Vidalii is one of the handsomest greenhouse plants in flower at Kew. It is quite distinct from all other

garden *Campanulas* in its shrubby habit, the main stem developing a head of about a dozen sturdy semi-erect branches, each a foot long, and clothed with oblong, fleshy, dark green, glossy leaves, and from the end of each of these branches is pushed a long, erect spike of waxy white flowers. After once flowering the plants are done for, as they never again make good, shapely plants. Seeds are ripened freely by cultivated plants, and from these it takes three years to produce a full-sized flowering specimen. Cuttings never grow into good plants. The species is a native of the Azores, and it is figured in the *Botanical Magazine*, t. 4748.

London.

W. Watson.

Cultural Department.

Training up an Orchard.

IT is not very difficult to prepare the land and set out 500 or 1,000 young Apple-trees. By this I do not mean that such work can be well done without much knowledge and considerable practical experience. The selection of trees from the nursery, the choice of varieties suitable to the locality and the market, the due preparation of the ground and the practical work of setting out the trees, all require knowledge and skill, for lack of which many orchards are more or less failures.

But when all of these beginnings have been well accomplished, not much more has been done toward a successful and profitable orchard than is done when we equip a son with the supposed requirements for entering college. We have a young orchard before us, and our duty is to keep each tree in the best shape and condition, so that when it begins to produce fruit it will not begin to show defects and suffer injury. Correct pruning is the first requisite of success, and it should be mainly knife-pruning—that is, a good orchardist will not allow any limbs that must finally come out to reach a large size.

One who thinks this a small undertaking will find himself mistaken. To keep an orchard properly pruned requires a well developed imagination. The orchardist must be able to see his trees in the mind's eye, as they will appear in three, six or twelve years. But to know how they will look implies a knowledge of the habits of growth of the different varieties under culture. So it might be said that an orchardist needs to spoil one orchard before he can know how to direct the growth of a second. It is only when the beginner has had the advantage of training under an expert that he will be likely to succeed at the first attempt.

The Apple has been so long under cultivation that very wide variations exist in its habits of growth. It is likely, also, that among our numerous varieties there exists considerable hybridity. We have not yet been able to produce any hybrids between the European Apple and our native species, and Professor Budd's experience seems to indicate that it will be a difficult task. But there is good reason to believe that the Apples of Europe are not all descended from a single species. Many of the recently imported varieties from Russia show remarkable distinctions from the older sorts, not only in habits of growth, but in microscopic differences in the structure of their leaves. It is being remarked, also, that they have, as a class, a more vigorous inflorescence, and that the texture of the flesh, and the flavors of these fruits, are more or less characteristic. In this country hybrids, both accidental and worked, between our old stock and the Siberian Crabs, have been produced and are in fruit in various localities.

Now all these matters affecting the habits of growth in so widely separated varieties are important to be known, before we can form a true conception of the work of pruning a young orchard and giving to each tree its proper form.

But the forming of the tree is only a single division of the task. We must know much about the habits of and means of checking and destroying the many insects, quadrupeds and birds which will interfere with our work. Unless these vermin can be promptly subjected and controlled, we may find our young trees much more than decimated at any time. Mice have been known to destroy hundreds of trees in one orchard in a single winter—gnawing the bark from the ground up into the larger limbs. There are remedies for a moderate amount of this barking by rodents, but a tree once thoroughly girdled by them is a hospital specimen forever after, no matter how skillfully treated. Bark lice come, sometimes, as though blown in clouds through an orchard, and only the most active treatment will subdue them. It is the same with the attacks of aphids, the tent and forest caterpillars, the web worms, the rank worms, and the borers. In short, the orchardist of the greatest skill and experience is many times "put to his trumps" successfully to meet emergencies and maintain the thrifty and uniform growth of his trees.



One of the Sacred Olive-Trees of Blidah.—See page 414.

All these things being successfully attended to, there are yet other matters equally important. The cultivation and fertilization of the soil of an orchard requires skill and knowledge. That the land should be first thoroughly put in condition before the trees are planted, is assumed at the start. But what shall be done with it while the trees are advancing toward the age of profitable bearing? What crops may be grown in a young orchard without injuring it, what manuring will it need and what shall be the method of tillage?

It may be set down as a positive rule that grain crops of any sort ought not to be grown in a young orchard. If a fundamental guiding principle is wanted, let it be that whatever crop is planted among fruit-trees must be one that will make its growth mainly after the trees have made theirs. In my own experience I have found Beans to be the best. They are not planted until the trees have made considerable growth, and do not draw much on the land before their terminal buds are formed. They come off early and allow of the superficial

cultivation necessary to destroy weeds. They need only shallow plowing and working, so that the roots of the trees are not much injured; and finally, the straw makes the best of all mulch for the trees, inasmuch as there is nothing in it to attract mice, it is not easily scratched about by fowls, it decays slowly, and when decayed makes a very rich dressing, as shown by the free growth of trees thus treated.

As to the amount of growth desirable in a young orchard, I think it should not be less than one foot annually, and that this must be maintained, where necessary, by a sufficient manuring. This may be either with stable-manure or any complete commercial fertilizer. Manuring sufficient to give a vigorous growth of Beans—yielding a crop of twenty bushels or more to the acre—will keep the trees growing just enough. An occasional dressing of ground bone and wood-ashes, at the rate of 1,000 pounds to the acre, always shows itself in giving vigor to the growth of the trees and a deep, healthy color to their foliage.

Newport, Vt.

T. H. Hoskins.

Notes on American Plants.

Hydrastis Canadensis (Orange-root or Yellow Puccoon) flowers early in May, but the flowers are not showy, and they come at a season when there are plenty of others. But the foliage is fine, and it is a pretty plant when in fruit. Its height is only about a foot, and the three large cordate leaves are from five to eight inches wide, deeply several-lobed, and they remain fresh and green nearly the entire season. It is valuable for shady situations, especially when a low foliage plant is needed. It needs a light soil. It is perennial, and when once established forms a thick and permanent bed.

Silphium terebinthinaceum (Prairie Dock), which blooms about the middle of August, is a showy and stately plant, from four to eight feet high, with numerous bright yellow flowers, two or more inches wide, and large radical leaves, often eighteen inches long by a foot wide, besides the long petioles. It is a member of the Composite family, common on prairies from Michigan and Iowa south to Georgia and Louisiana. It does well in any ordinary garden soil in the sun or a thin shade. It is a near relative of the Compass-plant (*S. laciniatum*), which has once or twice divided root-leaves and similar yellow flowers, and which in favorable situations sometimes attains a height of twelve feet, and comes into flower a little before the former. Both are desirable, but need more time to become established and attain their full size than most plants.

The Climbing Hempweed or Boneset (*Mikania scandens*), which is not rare in moist places along the margins of streams and borders of ponds from New England to Texas, climbing over shrubs or anything else by which it can hold itself up, flowers about the middle of August, and is a pretty climber for such moist places. It is a herbaceous perennial belonging to the Composite family. Both the foliage and small heads of purplish flowers are handsome. It comes readily from the seed or may be transplanted.

Another member of this same order, but not a climber, and which blooms a little later, is the *Artemisia Canadensis* (Sage-bush or Mugwort). The flowers are not conspicuous or showy, but its fine and abundant silvery foliage is very handsome. When stimulated by cultivation the plant spreads out over a large space. The stems are weak and half trailing, and so numerous that a single plant will cover a space of three or four feet in diameter if given room enough and a light, rich soil in the sun.

Southwick, Mass.

F. H. Horsford.

Rose Notes.

Rosa rugosa seems to be attracting much attention among the hybridizers of late years, and it seems reasonable to suppose that some advantages may thus be gained. The tough, strong foliage of this plant, and also its free growth, are points in its favor for hybridizing purposes, and it would therefore not be surprising if a numerous race of *Rugosa* hybrids should appear in the near future.

In this class is Madame Charles Frederic Worth (Schwartz), one of the recent introductions, and described as being very vigorous and perpetual flowering, flowers large, full, and well formed, and color carmine-red. If this new-comer justifies the above description it will doubtless prove a valuable addition.

Clothilde Soupert (Soupert and Notting) is a charming little Rose of the Polyantha type, flowering in corymbs which are very freely produced, and the flowers varying in color from deep rose in the centre to almost white on the outer petals. This has been largely propagated as a bedding Rose, and it is now proposed that it be grown for winter cut flowers, as its

small flowers would prove very useful for "filling" in design work.

A serviceable old Rose that has been somewhat neglected of late years is Duchesse de Brabant, possibly on account of the greatly increased list of pink Roses, many of which are larger and of more perfect form than this one. Still it is a plant of good constitution and a vigorous grower, useful either for summer bedding or for winter forcing. The flowers are of medium size, nearly double, and of a very pleasing shade of pink. When the plants are making strong growth the flowers are frequently produced in clusters, though this last characteristic is not always considered an advantage.

Among the dark-colored Hybrid Perpetuals, Alfred de Rougemont takes a prominent place when well grown, its large, fragrant, dark crimson flowers being admirable, and although in commerce for over a quarter of a century, it will still compare well with many of the newer sorts. This variety is also useful for forcing if not forced too early in the season, at which time it is very shy in flowering. This variety should not be confounded with Madame Alfred de Rougemont, which is a Hybrid Noisette of comparatively inferior quality.

Another of the older hybrids which should have a place in every collection of Roses is Marie Baumann, a variety of charming color and delightful fragrance. Its color may be described as carmine-crimson, or rather crimson shaded with carmine. The flowers are full and of fair size, the foliage and growth are strong and free, and altogether it possesses a combination of good qualities which it is hard to excel. Marie Baumann is also a good forcing variety, though the flowers sometimes have a finer color when grown in the open air than when under glass.

As a pillar Rose or for training along the roof of a cool conservatory, the old Noisette, Lamarque, is a first-rate variety, and when properly treated it produces immense crops of its large white flowers, while its bold foliage and strong growth are additional points in its favor. It is also an excellent stock upon which to graft Niphetos, the latter producing particularly fine flowers when thus treated; and while the grafting process may not be absolutely essential to the welfare of Niphetos, yet it certainly does appear to increase its vitality to the extent of making it produce heavy winter crops of flowers for a long series of years, at least when the stock used is Lamarque.

Very favorable reports have been given of the "Climbing Perle des Jardins," it being stated that the flowers are equal to and as freely produced as those of the type, while the growth is strong and vigorous and the foliage handsome, the distinctive feature being its scandent habit. It would therefore appear that a valuable addition had been made to the list of climbing Roses for in-door use at least, as in all probability it is no more hardy than the parent variety. Perle des Jardins sometimes endures full exposure to the winter in the vicinity of Philadelphia, but such treatment is not usually justified.

Holmesburg, Pa.

W. H. Taplin.

The Narcissi and their Culture.

THE question is often asked whether it is necessary, or even desirable, to lift the bulbs of Narcissi annually and replant them? My reply has invariably been in the negative. Last fall circumstances necessitated the lifting of a large collection of these plants, including all the common and well known kinds, besides a quantity of choicer varieties of garden origin. Some of these were planted immediately, before the bulbs were the least dried from exposure, while others were kept in barrels and planted later. In their old quarters the bulbs had been planted three years, and we found on lifting them that those sorts which increased rapidly from offsets were really in need of lifting, as the bulbs were so crowded as to render it next to impossible for them to develop properly. This was the case with all of the Poeticus section, and others of strong constitution, such as Sir Watkin, Horsfield's and Princeps. Others, again, had not multiplied to any great extent, and, to all appearances, would have done well another three years without being disturbed. The bulbs were planted nine inches deep and covered with earth enough to bury them, and then good, well decayed manure was placed on the soil to a depth of one to two inches, and the remainder of the soil filled in. The loss from removal was small, and could be traced in most cases to a subsequent disturbance of the soil for the purpose of lifting bulbs, which brought the manure in direct contact with those left in the soil. Taken altogether, the growth this spring was not so strong as in past years, though the flowers were quite as numerous, these, of course, being formed in the bulbs previously. It may be taken for granted

that, unless clumps or beds of *Narcissus* have become crowded, it is by no means necessary to lift them at all, provided that, in common with all other permanent occupants of the flower-border, they receive an annual top-dressing of good manure in fall, the remains of which may be raked off very early in spring, before the leaves appear above ground.

It is surprising that one may visit so many places even among good gardens, without seeing anything like a collection of these loveliest of spring hardy bulbs. I have visited many gardens of late and have seen but one where any other than the commoner kinds were grown, and this was a trial collection; as if it had not been proved again and again that the *Narcissus* adapts itself readily to our eastern climate. One very important point, however, is to plant early, if imported bulbs are procured, for success the first year hinges upon a vigorous root-action before the arrival of frost. It is not too late to transplant, and this is the very best time to plant imported bulbs. It is well to be cautious with new or little known kinds when forming a collection. There are enough well tried varieties which may be relied on to do well, and which include the very best of Daffodils, such as *N. princeps*, an early kind, *N. Poeticus* and its varieties, which are always admired, and by planting with the type several varieties, such as *Angustifolius*, *Ornatus* and *Recurvus* these Poet's *Narcissus* may be had in bloom for six weeks. They flower in the order named, the type following the variety *Ornatus*. *N. maximus* is one of the best kinds, and reliable, being of robust habit. Horsfield's variety is to my mind the best and most distinct of all in cultivation. It forces well and is a general favorite. The varieties known as Emperor and Empress are noble kinds, but not reliably hardy.

The giant Welsh Chalice Flower, however, is perfectly hardy, has immense flowers, and is perhaps the most profitable Daffodil ever handled by the trade, owing to its rapid increase and the growing demand that keeps up the price. Where one bulb is planted three may be dug in a year's time. It is obviously a good sort to have. *N. obvallaris*, the Tenby Daffodil, with its airy appearance, is very early and also forces well. Golden Spur is a kind of recent origin; it is very large, early and of a rich yellow color. The pretty, sweet scented Jonquils, with their Rush-like leaves, should not be neglected. *N. gracilis* has similar foliage with clusters of fragrant yellow flowers, and is the latest flowering variety we have tried; it always blooms in the latter part of May and is quite hardy. Those who have a greenhouse should try the Hoop-Petticoat *Narcissus*. These are easily procured, flower abundantly even when forced, and are known as *N. bulbocodium*. If the soil is of a retentive nature a handful of sharp sand should be placed under each bulb when planted; this assists the young roots to push their way into the soil and acts as drainage to the bulb when at rest.

South Lancaster, Mass.

E. O. Orpet.

The Florists' Convention.

Extracts from Papers Read.

THE annual convention of the Society of American Florists, which was held in Boston last week, attracted a larger attendance than any former meeting. The plan of omitting the afternoon session each day gave such an opportunity for social enjoyment and sight-seeing that the sessions in the morning and the evening were always well attended, the large hall in the horticultural building being filled in every instance. A resolution was passed that at future meetings the exhibitions shall be closed when the Society is in session. This will leave nothing to draw members away from the exercises and will be an additional improvement. The papers read were of a practical character, and the discussions were pointed and business-like. The local florists' club made the visiting members welcome in every way, and by arranging excursions not only in the harbor, but to such interesting places as the grounds of Mr. H. H. Hunnewell at Wellesley and Mrs. F. B. Hayes at Lexington, gave an opportunity of inspecting some of the most interesting examples of the gardener's art that could be found in the country.

The trade exhibits in the lower hall were very interesting. Mr. Chas. D. Ball, of Holmesburg, and Mr. Henry A. Dreer, of Philadelphia, Robert Craig and Edwin Lonsdale had exhibitions of their stock in trade in plants in fine health and grouped with much taste. The Messrs. Pitcher

& Manda also showed a large exhibit of *Cypripediums* and other Orchids, including many choice hybrids and a plant of *Licuala grandis*, which is probably the best specimen of its kind in existence. The exhibits of bulbs, seeds and florists' supplies by F. R. Pierson, Joseph Breck & Sons, F. E. McAllister and others were most attractively arranged, and the display of heating apparatus and other greenhouse requisites in Bumstead Hall was unusually complete and instructive.

Abstracts of some of the more important papers are given below:

THE PRESIDENT'S ADDRESS.

The address of Mr. Jordan was largely devoted to the needs of a higher horticultural education both for the benefit of the florists and of the public. He insisted that the mission of the Society was not only to instruct members in the daily practice of their business, but to increase the general interest in horticulture and to develop a taste for it among the people. To this end all persons interested in the various departments of horticulture, as well as those engaged in researches in any science connected with it, should be invited to assist in this work.

Large fortunes have been bequeathed to religious institutions by persons who, of course, cannot foretell what may be the specific teachings of any sect a century hence. Libraries have been established and schools endowed to carry out some wish of their donors, and yet it must be acknowledged that comparatively few receive the benefit of these endowments when compared with the masses of people, young and old, rich and poor, learned and illiterate, who can take object lessons from parks and gardens. These were no doubt the sentiments which inspired Mr. Henry Shaw to bequeath his immense fortune for the purpose of instructing the people in an ever-growing knowledge of horticulture. By his will a botanical garden is given to the public with means to insure its constant and effective maintenance for the cultivation and propagation of plants and flowers, fruits and trees, together with a museum and a library devoted to the service of botany, horticulture and allied subjects. A school has already been established under the direction of Professor Trelease for young men who are to be trained in the science and art of horticulture. The income of the estate already realizes hundreds of thousands of dollars, and will soon reach the magnificent sum of \$1,000,000 a year. The world can safely be challenged to show a like donation from any one individual.

Mr. Jordan also spoke of the advantages offered by the experiment stations, which are to make a regular business of discovery, to promote investigation and to diffuse the knowledge which improves horticultural practice. The United States Department of Agriculture has arranged to condense the bulletins from the various stations, and they are delivered free to all who see fit to ask for them, so that every one engaged in horticultural pursuits has it in his power to gain useful knowledge by consulting them. He counseled each member of this Society to make the acquaintance of the Director of the nearest experiment station, to furnish him with plants and trees for testing, and to report such facts as may have been learned by him in his business practice. By such an interchange of knowledge the profession will advance to a higher plane, where less drudgery will be needed and where work will be done in accordance with the established laws of science.

The speaker argued that there should be established some standard of qualification for young men entering into the employment of florists to learn the business. The time will soon come when many of our institutions of learning may graduate students prepared to become florists' apprentices. He added that suitable books should be prepared for use in schools which give instruction in the fundamental principles of horticulture, and insisted that even common schools should teach the rudiments of the art.

EXPERIENCE IN CROSSING PLANTS.

Mr. E. S. Carman, editor of the *Rural New Yorker*, read a paper recounting some of the failures he had met and the successes won in this field during seventeen years past. The record of failures is omitted here for the lack of space, although it was quite as interesting as the remainder of the paper, from which we make the following extracts:

In my practice a sharp pair of scissors, a pointed piece of wood (or even a wooden toothpick), a box for the flowers or pollen, sheets of firm tissue paper and a little strong yarn answer every purpose, so far as tools and mechanical outfit are

concerned. A camel's-hair brush is rarely of service. If pollen can be gathered in quantity, as from Rye, Roses, Honey-suckles, etc., it may be placed in boxes and applied from the point of a knife or by placing the ripe anthers themselves in contact with the receptive stigma.

In performing the operation the bud should be opened, the green anthers removed and the bud tied up in close, fine tissue paper. Open it only to apply foreign pollen to the stigmas, and at once again protect them from possibility of contact with any other pollen. If fruits and seeds then develop we are confident that the seeds are cross-breeds.

About fifteen years ago we began crossing Wheats. While engaged in this way it occurred to me to make the attempt to hybridize Wheat and Rye. The result of pollinating many heads was ten seeds, nine of which germinated and wintered safely. Eight resembled Wheat in every way, and the plants scarcely differed from the mother, which was Armstrong, a beardless variety. The ninth plant was peculiar in having hairy culms and long, narrow heads, of which there were about twenty; and these twenty heads were so nearly sterile that they bore only a grain or so apiece. The other plants were all fertile, and several of them were again pollinated with Rye. It would take a long time to recount the suggestive, instructive history of these plants. I have now plants which by blood are fifteen-sixteenths Rye. These were nearly sterile, and all attempts to again cross with Rye have resulted in absolute sterility. Some of the fifteen-sixteenths Rye plants grow more fertile each year. Many of the three-fourths Rye plants are now fully fertile, and so well fixed that we are propagating them for introduction, while three of the half-breeds have already been introduced. Many of the hybrids bear very large kernels, long heads, with close spikelets. Some of them are as early as Rye, and perfectly hardy at my home. Thousands have been destroyed on account of their conspicuous worthlessness.

Some years ago Professor William Saunders, of Canada, told me he thought he had effected a cross between the Raspberry and the Blackberry. We made crosses the next season and every season since. The Raspberry alone was used as the mother plant the first year. Some of the seedlings were Raspberries in every way, some were Blackberries in every way, a few were intermediate. Whether an improved variety will come out of these remains to be seen. Thus far, all that have fruited produce imperfect berries; that is, berries with from one to a dozen drupelets; while others bloom but do not fruit at all. Professor Saunders' Hybrids were from some accident destroyed before fruiting.

We have never raised a Rose from any other seed than that borne by *Rosa rugosa*. This plant is very hardy, bearing leaves of exquisite beauty—thick, leathery, with a glossy, wrinkled surface. The flowers are large, single, and in color white or pink. As a pollen parent we used the first summer Harison's Yellow, and that alone. This is a very hardy Austrian Rose with small leaflets, bearing semi-double yellow flowers. Most of the seedlings died from mildew. Only about thirty survived. When it is considered that *R. rugosa* differs from all other Roses in such a marked way, one would naturally have supposed that its seedlings would be stamped with its peculiar characteristics rather than with those of the male parent, which may be said to resemble, in a general way, a hundred other Roses. Such was not the case. Most of the seedlings resembled the male parent in having small leaflets which were neither wrinkled nor of unusual thickness. The flowers were a yet greater surprise. All the single flowers are small, the colors being rosy white, pink, dark pink. There were neither yellow nor pure white flowers. One bush bears small single flowers, which are a feeble Rose color around the edges, then white and finally yellow about the base. Of the double flowers one bush bears pink flowers, which are as "double" as a Rose well can be. The leaflets show the *Rugosa* blood plainly. Three others bear *Rugosa* foliage. The flowers of two are semi-double, of the color of General Jacqueminot. The third, which during the past year has been propagated for introduction by a leading nursery firm, bears flowers identical in color with those of General Jacqueminot. The color is also the same. It is as nearly a perpetual bloomer as is the mother plant. The leaflets, while preserving much of the thick, wrinkly texture, are larger than those of *R. rugosa*. Would any one have prophesied that a yellow Rose crossed on a single pink Rose would have produced a plant so closely resembling General Jacqueminot?

The next year we used pollen from Hybrid Perpetuals, and the next, as well as the present, season from Yellow Teas chiefly. Of these none that have bloomed are yet worthy of remark; we have about 300 in all. The present season

has been specially favorable to an abundant harvest of hybrid seed; probably we have no less than 3,000.

When the hardy and distinct characteristics of *Rosa rugosa* are considered, one would suppose that the children of such a rugged mother would be healthy and strong. The fact is, however, that nine-tenths die of mildew. It is worthy of remark, also, that not one seed in ten is viable. They are shells without embryo.

Finally, you have all heard of the Great Japan Wineberry. Though this is the old *Rubus phanicolasius*, which has been in certain nurserymen's catalogues and in private collections for a dozen years, it is still a most remarkable Raspberry, worthy of a place in every collection. The forming berry is enclosed within the sepals, which are covered with purple viscid hairs, like the bud of a Moss Rose. This protects the fruit from worms, for all small insects are caught and held by the sticky exudation. As the berry ripens, the sepals fall back. The berry, at first a bright, diaphanous scarlet, turns, as it ripens, to a rich ruby color. The berries are juicy and of a refreshing, sprightly quality, with scarcely a trace of the peculiar Raspberry aroma. Upon this we have succeeded in crossing both the Blackberry and the Rose.

SPECIAL FERTILIZERS UNDER GLASS.

Professor S. T. Maynard, in a paper on this subject, began by saying that the three essential conditions for the successful growth of plants under glass are these: the proper amount of water, a temperature suited to their growth and an abundance of plant food. All of these conditions are necessary, and it is difficult to say whether one is more important than another; but the last condition, that of plant food for greenhouse crops, was alone to be discussed.

In making up the soil for greenhouse plants, whether grown in pots or beds, the principal ingredients are: turf, more or less decomposed, or garden soil, and stable manure either fresh or decomposed, according to the nature of the plants to be grown. With these materials properly put together, very successful results are generally obtained by the skillful gardener; but sometimes, either from poor quality of the manure used, from a poor mechanical condition or from improper treatment after being put into the beds or pots, plants fail to make the vigorous growth we desire. Then it is difficult to get enough plant food into the small space of the flower-pot or bench; a small amount of soil and root space being necessary to secure an abundance of bloom. In houses naturally moist we must use a small amount of soil to secure a healthful condition for the growth of the roots; and therefore we must find something to increase the food supply in the soil and to give the plants a start. This has led to the use of liquid made from stable manure. Green manure is placed on the surface of the bench or pots and plant food is washed into the soil by a liberal supply of water. Plants grow well under this practice, but the manure is offensive and requires a great amount of labor and care in its application. We believe that the necessary supply of plant food may be more easily and safely obtained from chemicals and special manures.

After the mechanical conditions have been made right, there is little danger of getting the soil too rich for the common commercial crops, if all the elements of plant food necessary for a complete and perfect growth for the purpose desired are present; that is, if a leaf growth is sought for, potash and the nitrogenous elements must be used, while if seed or flowers are desired, the use of phosphoric acid in the form of fine bone or bone black is recommended.

After the crop has been started, one of the best ways to furnish additional plant food is in a liquid form. The soluble chemicals, however, like the potash salts and the soluble nitrates, must be applied with care; for if the liquid is allowed to remain for a considerable length of time on the foliage it is liable to be seriously injured. The so-called flower-foods and the standard commercial fertilizers of various manufacturers have been very successfully used. For house plants, when the grower is not skilled in the preparation of soil for the perfect growth of plants, the flower-food gives excellent results.

Professor Maynard then gave the details of several comparative experiments in growing Carnations, Pansies, Lettuce and Cabbage plants under glass with various special fertilizers. It is not necessary to give these in full, although the complete tables in which the effect of the various fertilizers were used singly and in combination would be very instructive. The summary of the whole matter is given in Professor Maynard's own language as follows:

Summing up the results of these various experiments we come to the conclusion that, of the nitrates, the sulphate of ammonia gives the best results; that of the potash and soda

salts, the sulphate of potash has given by far the best results. Bone black, in view of these tests, must be given the first place in hastening the maturity of plant growth and in the production of seed, while the nitrate of soda seems to be injurious rather than beneficial. These, however, can be given only as the results of a comparatively limited series of tests; and all careful experimenters know how difficult it is to be sure that all the conditions are fully understood and how unsafe it is to draw conclusions from anything but a long series of experiments. But having taken every precaution to fully understand all the conditions and to make very careful and complete records, and as the results confirm the opinions of some of our best scientists, we feel warranted in recommending, as special fertilizers for greenhouse crops, sulphate of ammonia, sulphate of potash, ground bone and dissolved bone black.

The fact that the nitrate of soda has a tendency to absorb moisture is sufficient to account for the increased amount of mildew and the poor growth of the Lettuce in one plot in both experiments. Why the muriate and nitrate of potash have given no better results must be explained by one who is more of a chemist than I am.

Dried blood and other animal nitrogenous substances are very unsatisfactory in the greenhouse, because of the amount of moisture and animal life they produce in the process of decay.

Potash and other salts must be carefully used and only in small quantities at a time, as in the evaporation of the water from the soil the salts are deposited upon the surface, and, where the tender leaves come in contact with it, they may be seriously injured. Many a batch of seedlings and cuttings has been destroyed in this way, and conditions favorable for fungus growths produced in the tissues of the injured foliage.

Whatever may be your opinions of the results of these experiments, I wish to urge you to give them careful consideration, to repeat them, to verify them and to make other experiments, carefully recording all conditions and results, and to report them at future meetings or to your favorite paper. The value of any new method of cultivation or fertilization must be finally determined by the practical gardener, who is making his living by his labor; and he and the man of science should work together—the one making known his needs, and the other working, in the light of science, to present new truths and to make the practice more easy and profitable.

HELLEBORES FOR THE COMMERCIAL FLORIST.

William Falconer, of Glen Cove, Long Island, read the paper which follows on this subject:

We have two sets of Hellebores—namely, Christmas Roses and Lenten Roses. The Christmas Rose (*Helleborus niger*) and its varieties bear large white flowers in November and December. The Lenten Roses are represented by *Helleborus Olympicus*, *H. Colchicus* and *H. orientalis*. They have purple flowers, while some of their varieties and hybrids have white, purple and spotted flowers, and they come into bloom between January and April.

Christmas Roses are useful as cut flowers, and in pots, if in bloom, they are excellent for house decoration. The Lenten Roses are only useful as pot plants; but both would be classified as "fancy" rather than as staple articles. Florists who have a good local trade can use Hellebores to advantage, but it would be hardly advisable for florists who grow flowers for the wholesale market to handle them.

For cut flowers *Helleborus niger maximus* is the best, but the blossoms must be cut just as wanted for use, for they have no great lasting qualities. One of our leading Boston florists who has handled these flowers writes: "I am a little in doubt about their value as cut flowers. Those I had last winter did not come up to my expectations in keeping qualities, being inclined to hang and droop their heads too much. As pot plants they will give much better satisfaction. The demand at first will be limited and it will grow slowly; still the flower is one that it will pay to grow as a desirable novelty." A New York florist writes: "There is no doubt that *Helleborus niger maximus* and the larger-flowered varieties of *H. niger* would be profitable for cut flowers if large established plants were planted out in a cool greenhouse or a well protected cold frame. The great difficulty, however, lies in the first cost of these large plants, and secondly, in the fact that, as a rule, a florist wants to get immediate return for his investment, and will not wait four or five years or until his plants become large enough to produce an abundance of blooms."

My own opinion of these Christmas Roses is that they are a most welcome addition to our cut flowers, and particularly valuable as they come in at a time when variety as well as quantity is somewhat limited.

As pot plants the Lenten Roses are very desirable, but they need to be strong plants and well grown. Neither the Christmas Roses nor Lenten Roses can be grown profitably as outdoor hardy perennials. They need cool greenhouses or frames. The Christmas Roses should be planted out permanently, and for this reason I prefer growing them in cold frames. As the Lenten Roses are pot plants they may be plunged outside in cold frames in summer, and brought indoors in winter, or, if wanted for late work, kept out in the frame till they show signs of blooming, and then brought indoors. They all prefer a well drained loamy soil, with a loose surface and a somewhat shady place in summer. A frame up against a north or north-west facing wall of a building is a good place for them; or they can be grown under a high-raised lath or brush-shading, such as is used over forest-tree seed-beds. The ground about them should be mulched with half-rotted leaves and finely chopped sphagnum moss, and this keeps it cool, loose and moist all summer.

A Baltimore delegate explained the workings of a florists' exchange in that city which was organized last year under the State laws, and is governed by seven directors—four growers and three dealers. The prices are set by the officials of the exchange, unsold flowers are destroyed and the losses are borne by the exchange members in proportion to the amount of stock they hold. The commission the exchange makes pays the salary of the manager and necessary expenses. The system is said to work well and to give an opportunity for growers to dispose of small lots which a commission merchant would hardly care to be troubled with.

In response to the inquiry "What twenty native plants are the best for florists' use," Mr. A. Gilchrist, of Toronto, Ontario, submitted the following list: *Trillium grandiflorum*, *Cypripedium spectabile*, *C. parviflorum*, *C. pubescens*, *Asclepias tuberosa*, *A. incarnata*, *Euphorbia corollata*, *Coreopsis lanceolata*, *Helianthus strumosus*, *Spiraea lobata*, *Nymphaea odorata*, *Thalictrum Cornuti*, *Rudbeckia laciniata*, *Rudbeckia hirta*, *Eupatorium ageratoides*, *Solidago Canadensis*, *Aquilegia Canadensis*, *Lobelia cardinalis*, *Monarda didyma*.

In reply to the question, What are the twelve best hardy shrubs for florists' use? Mr. Jackson Dawson gave the following list as the best among those that are rarely or never forced for market: *Andromeda speciosa*, *Cytisus scoparius*, *Viburnum plicatum*, *Staphylea Colchica*, *Deutzia Sieboldii*, *Exochorda grandiflora*, *Pyrus baccata floribunda*, *Rubus rosiflorus*, *fl. pl.*, *Weigela candidissima*, *Philadelphus latifolius*, *Spiraea Cantoniensis*, *fl. pl.*, *Kalmia latifolia*.

The following officers were elected for the ensuing year: President, M. H. Norton, Boston; Vice-President, John Chambers, Toronto; Secretary, W. J. Stewart, Boston; Treasurer, M. A. Hunt, Terre Haute, Indiana. It was voted to hold the next annual meeting at Toronto.

Exhibitions.

The Horticultural Show at Boston.

THE annual exhibition of the Massachusetts Horticultural Society, held while the Convention of the Society of American Florists was in session, was conspicuously good in all its details, and was considered by many of those whose judgment is of value in such matters as the best display of the kind which has been seen in this country for years. The exhibition was held in the large Music Hall, and yet the collections occupied so much of the floor space, including stage and galleries, that the throng of visitors had extreme difficulty in moving about without injuring the specimens which skirted the various groups, and even then it was found necessary to pack many of the plants so closely together that large numbers of the very finest of them could not be seen to good advantage.

The exhibition began outside the doorway with a collection of conifers, containing fifty-six species and varieties, from Mr. J. W. Manning, and with similar groups within the vestibule from the Messrs. Temple & Beard and Wm. C. Strong. Some fine specimens of Hydrangea with blue flowers, from Mr. John L. Gardiner, added interest to these outside groups. The view from the stage was almost bewildering. The ample balustrades in front of the balconies were festooned with greenery, with large specimens of *Nepenthes* hanging beneath. Masses of cut flowers made a brilliant appearance in the lower balcony, while in room-like apartments below the balcony and opposite the stage were a number of elegant table and mantle decorations. Under the shade of some immense Palms in the centre of the room was a blaze of bloom from gorgeous

aquatics, while all around the main floor were groups of plants from the best known collections in the vicinity of Boston. In the centre of the stage was a magnificently colored specimen of the Croton, Queen Victoria, exhibited by Mr. George A. Nickerson, of Dedham. Behind it were tasteful groups of foliage plants from the establishments of Mr. F. Becker and Mr. W. E. Doyle, of Cambridge, while about the great Croton were some remarkable plants, among them the highly decorative *Dasyllirion acrotrichum* and large specimens of *Akamanda* and *Agapanthus*, and some magnificent *Fuchsias*, including a fine plant of the variety *Gloria*, well known forty years ago, but now rarely seen here.

Our limits of space will only permit a mention of some of the most meritorious of the plants in the various collections upon the floor, and no doubt among the great number of those represented many good specimens escaped attention altogether. The first group to demand attention was that from the Botanic Garden of Harvard University, which contained excellent specimens of *Gymnogramme calomelanos*, *G. Tartarica*, *Sanseveria Zeylanica*, *Peperomia arifolia*, with choice *Adiantums*, *Selaginellas* and *Marantas*.

Adjoining this was the extensive rich collection of Mr. Nathaniel T. Kidder, including such well-grown specimens of *Cycas revoluta* and *Araucaria excelsa* as are rarely seen. A large plant of *Davallia Mooreana* was greatly admired, as was one of *Cyanophyllum magnificum* and another of *Spherogyne latifolia*. Here also was a fine specimen of *Phyllotanium Lindenii*—a plant whose popularity is evidently on the increase, since it occurred in no less than six other collections.

In the large group furnished by Mr. John L. Gardiner, and arranged with great taste by Mr. Atkinson, were splendid examples of *Gymnogramme schizophylla*, *Adiantum Farleyense*, with remarkable *Marantas* and *Pandanads*.

Noteworthy in the large assortment from the gardens of Mr. H. H. Hunnewell were: *Ficus Parcellii*, *Cissus discolor*, *Croton pictum*, *Dracana indivisa*, *fol. var.* (a particularly elegant variety) and *Davallia Fijensis*.

The collection of Mr. F. L. Ames was so notably good throughout that it is difficult to single out one specimen for special mention, but *Lomaria gibba*, *Platynerium Hillii*, *Anthurium Waroqueanum*, *Croton Mortii*, *Dieffenbachia Bausei* and *Anthurium Veitchii* seemed particularly interesting.

Some grand plants were shown by Mrs. J. Lassell, of Whitinsville, Massachusetts. Specially noticeable were the specimens of *Heliconia aurea striata*, a grand plant for decoration, and one which must soon come into general use, *Alocasia* species, *Dracana Youngii*, and *Gleichenia Mendeli*, a plant of splendid proportions. Two specimens of *Peristeria elata* attracted much attention, and they were worthy of it, for one of them bore no fewer than twelve spikes, one of which had seventeen fully developed flowers and as many more partially developed.

Specimens of *Phoenix rupicola* and *Kentia Belmoreana*, shown by Mr. George A. Nickerson, were among the noblest plants in the whole exhibition.

Some fine Orchids were contributed by Messrs. Siebrecht & Wadley, of New York, and the collection of Mr. Ames was exceedingly rich and varied, containing a great portion of the best plants in bloom at this season. It would be difficult to find better plants of *Lælia crispa superba*, *L. elegans Littleana*, *L. callistoglossa*, *Cypripedium Morganæ*, *C. wnanthum*, *C. bellatulum*, *Odontoglossum grande* and *Cattleya Eldorado*.

Among miscellaneous plants the Harvard Botanic Garden contributed collections of Cacti, with economic and interesting plants; Mr. Smith, of the Washington Botanic Garden, a large collection of carnivorous plants; Mr. R. H. White, a flowering specimen of *Monstera delicosa*; Mr. Benjamin Gray, specimens of the Papyrus, and Mr. David Allen, a remarkable group of Anthuriums. Among the aquatics the cluster of Egyptian Lotus from Mr. Sturtevant's famous pond in New Jersey attracted much attention. Mr. L. W. Goodell had a most complete and beautiful collection. It contained specimens of twenty-five highly desirable water plants, with the information that they were all hardy.

Among the principal awards made were the following: Mr. H. H. Hunnewell received the first prize for Palms, for greenhouse plants, for Caladiums and for Dracænas; Mr. N. T. Kidder, for Ornamental-leaved plants, Ferns, Adiantums, Lycopods and Crotons; Mr. F. L. Ames, for Orchids, for the best single Orchid (*Lælia crispa*), for specimen ornamental-leaved plant and Nepenthes; Mr. John L. Gardiner, for greenhouse plants and Nepenthes; Dr. C. G. Weld, of Brookline, for specimen Tree-Fern, Crotons and Gloxinias; Temple & Beard, for coniferous trees and hardy herbaceous flowers; Mr. O. A. Ruggles, for the best floral design; Mr. David Allen, for the

best mantel-piece decoration; Mr. L. W. Goodell, for aquatic plants and flowers. A silver medal was awarded to Geo. A. Nickerson, for the Croton Queen Victoria, and one to G. McWilliams, for a remarkable *Alocasia*.

Notes.

The journal of the Japanese Horticultural Society states that the exports of plants, trees and shrubs from Japan during the month of January last amounted in value to very nearly \$6,000.

A sketch of the life of Reichenbach, the great authority on Orchids, written by his executor, Dr. Dilling, and originally printed in a periodical, has recently been issued in pamphlet form by Lucas Graefe, of Hamburg.

In a recent number of the *Revue Horticole* Monsieur Charles Naudin states that about eighty species or well-marked varieties of Eucalyptus are now growing in the gardens of the Villa Thuret at Antibes, while several additional species may be found in adjacent localities.

The *Revue Horticole* names as "the horticultural marvel of the year 1890" a new Wistaria (*W. multijuga*), which has bloomed in abundance in the gardens of Monsieur Bertin at Versailles. "Although introduced long ago," adds the *Revue*, "it is hardly known even to botanists, and has been almost impossible to find." It greatly resembles the ordinary Chinese Wistaria, but nevertheless differs from it in ways which the *Revue* promises to explain with fullness at a future time. Meanwhile it is noted that its flower-clusters measure from thirty to forty inches in length.

The American Association of Cemetery Superintendents held its annual meeting in Boston while the Florists' Convention was in session. More than sixty members were present from all parts of the country, and the papers and discussions, which related to all parts of the management of cemeteries, were unusually interesting. The discussions seemed to show that public taste is tending toward a limitation of stone-work, and a stronger reliance upon planting, for general effect. The use of hedges, coping and other conspicuous separations between lots was pretty generally discountenanced, and opinion favored an open, natural treatment of burial-grounds rather than the more rigid and architectural method which once prevailed in cemeteries, and which has its most conspicuous representative now in Greenwood. Mr. John G. Barker, Superintendent of Forest Hills Cemetery, was elected President for next year; R. D. Cleveland, of Lakewood Cemetery, Minneapolis, Vice-President, and Frank Higgins, of Woodmere Cemetery, Detroit, was made Secretary and Treasurer. Mr. O. C. Simonds, of Chicago, was elected Chairman of the Executive Committee. Instructive papers were read by William Solway, of Cincinnati, on "What Trees to Plant and When to Plant Them"; by Mr. O. C. Simonds, of Chicago, on "Shrubs and Trees"; Mr. A. W. Blaine, of Detroit, on "Mistakes in Cemetery Management"; Mr. George Troup, of Buffalo, on "Cemetery Roadways," and Mr. Frank Eurich, of Toledo, on the "Life and Service of Adolph Strauch," the originator of the so-called Lawn System in cemetery design and management.

Experiments in spraying Peach-trees for the Curculio with London Purple resulted last year, especially in the Peach-region of Michigan, in great injury to the foliage, so that Professor Cook in a station bulletin declared that the foliage of the Peach-tree is especially susceptible to injury, and that London Purple is more injurious than Paris Green, owing to the fact, no doubt, that the soluble arsenic is abundant in London Purple and almost absent in Paris Green. Experiments at Cornell made for two seasons seem to corroborate this view, and from a recent bulletin by Professor Bailey it appears, without going into details, that leaves sprayed by London Purple were found to contain arsenic in the texture of the leaves, while those injured by Paris Green showed none. The poison in the latter case simply affected the surface of the leaf. Undoubtedly the injury is caused by the fact that over fifty per cent. of the arsenite of calcium in London Purple is soluble in water, and is thus carried into the body of the foliage. Young leaves are proved to be less liable to injury than full grown ones, which is due, it is supposed, to the wax covering so abundant on recent leaves and shoots. Microscopic examination shows that the Peach-leaf is a very delicate structure, the epidermis being remarkably narrow and the cell-walls thin. This delicacy of structure seems to account for the greater susceptibility of the Peach-leaf to injury than the leaves of the Plum and other trees. A mixture of one pound of Paris Green to 300 gallons of water, when applied in a fine spray, did not injure the Peach-trees. Probably one pound to 350 gallons would be always safe.

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The Flowering Dogwood.

THE trees called in popular language Flowering Dogwoods give a peculiar charm to the forests of North America. There are two of these trees, and their counterpart is not found in any other part of the world. In early spring one of them enlivens the deciduous forests of south-eastern America, and the other lights up the gloomy Pines and Firs of the far north-west.

We will glance first at the floral structure to which these plants owe their peculiar beauty. The flowers of the Cornel are individually small, and green or greenish white or white in color. They are arranged in some species in close heads, and in others in open, flat, spreading cymes. The last is the more common arrangement, and the flower-clusters of some of the American species in which the flowers are grouped in this fashion are very beautiful, especially those of *Cornus circinata* and of *Cornus alternifolia*, the former a good-sized shrub, and the latter a small tree or tree-like shrub, of the north Atlantic forests. In those American species in which the flowers are placed in a close head the flower-cluster is surrounded by four or five large leaf-like bracts which enclose it in the bud. These open before the flowers expand and soon begin to enlarge. At this time they are of a rather dirty greenish white color and not more than a quarter of an inch long. They grow rapidly, and at the end of ten days or two weeks are one and a half or two inches long on the eastern tree, or sometimes twice that length on the Pacific coast species, and pure snowy white. To these large showy bracts or floral leaves the Flowering Dogwoods owe their name, and not to the flowers, which are very small, of a pale greenish color, and quite inconspicuous.

The fact that the vernal beauty of these trees is due to leaves and not to flowers lengthens the time of what is popularly supposed to be their flowering period; for the floral leaves have already grown to more than half their size before the true flowers open, and their time of greatest beauty does not come until after the flowers have fallen. The flowers and the floral leaves open and fade before the trees put forth their true leaves, so that they appear in flower like one mass of dazzling white.

The Cornels with showy floral leaves are confined to the New World, the group being represented by the two Flow-

ering Dogwood-trees, one in the east and the other in the west, and by the pretty little herbaceous Bunch-berry, a familiar flower of our northern woods, which it carpets in spring with its large white bracts, and cheers in the late autumn by its large clusters of brilliant scarlet fruit, and by another species resembling this last, and peculiar to Alaska and the far northern parts of the continent. These are all that have come down to us from a very peculiar group of plants which, in earlier times, were more widely scattered over the earth's surface than they are now. For the ancestors of our Flowering Dogwoods occurred in Europe, where, however, their descendants have been unable to obtain a foothold, as well as in America.

As ornamental trees, the Flowering Dogwoods, especially the eastern species, are not easily surpassed. This tree, to which botanists have given the name of *Cornus florida*, is a low, round-headed plant, with spreading branches and a straight, usually slender, trunk. Under favorable conditions it attains sometimes in the south a height of forty feet, with a trunk often a foot or a foot and a half in diameter. The leaves are ample in size, dark, lustrous green on the upper surface, the lower surface covered with pale glaucous bloom. They turn in autumn to a crimson color, which finds its only equal in brilliancy among American trees in those of the Sour Gum and of the Liquidambar. The effects of the color of the tree at this time of the year are heightened by the contrast between the darker hues of the upper surface with the paler shades of the lower. The fruit is an oval scarlet drupe half an inch long, borne in dense spherical heads. It ripens in the late autumn, and then adds much to the beauty of the trees when birds permit it to escape them. The claims, therefore, of the Flowering Dogwood as an ornamental tree are its hardiness, its size and habit, the beauty and durability of its inflorescence, its handsome foliage and fruit and the brilliancy of its autumn foliage. It grows from southern New England and Minnesota to Florida and eastern Texas, reappearing on the mountains of north-eastern Mexico. This tree is not common at the north, and east of the Hudson River it never reaches any great size. In the middle states, however, and in the south and south-western part of the region which it occupies, it is one of the most common inhabitants of the forests of deciduous-leaved trees, affording the most conspicuous feature in the landscape, and lighting up the borders of forests and fields with masses of dazzling white.

This little tree produces wood which is not exceeded in strength and in the toughness and closeness of its grain by that of many other American trees. It is valued in turnery, for the hubs of small wheels, for the bearings of machinery, and even for wood-engraving. The bitter properties of the bark make it useful as a tonic and give it a place in the materia medica.

The appearance of this tree when in flower is shown in our illustration on page 431. It represents a fine specimen growing in the country place of Mr. A. L. Barber, at Grimes' Hill, Staten Island, and is from a photograph by J. Loeffler, Tompkinsville, New York.

The Pacific Coast Flowering Dogwood, the *Cornus Nuttallii* of botanists, is in some respects a finer tree than its better known Atlantic relative. It grows taller, and it is not unusual to find individuals among the great Fir-trees near the shores of Puget Sound, a region remarkable for its great trees, sixty feet or more in height. The flower-bracts are nearly twice as large, and therefore more conspicuous. The leaves, however, do not assume the brilliant autumn tints of those of the eastern tree, and its tall, slender mode of growth makes it less desirable as a cultivated plant. Apparently the Pacific Coast Dogwood is not an easy plant to cultivate outside the region where it grows naturally. It was first introduced into gardens many years ago, but we cannot remember to have ever seen a plant of any size in any garden, and all recent attempts to cultivate it have proved unsuccessful. Other plants of the same region are, however, perfectly at home

in the gardens of Europe, and a few of them, like the Vine Maple, do fairly well in those of this country. It is possible to hope, therefore, that when the secret of the successful method of cultivating this western Dogwood has been discovered, an ornamental tree of the first class will be given to our plantations.

This species grows from British Columbia to the mountains of southern California. It attains its greatest size in western Oregon and Washington Territory, and the traveler through the great Fir-forests of that region at the time of year when the Dogwoods are in flower will never forget the impression upon his imagination which their appearance creates.

The Treatment of Trees in Drought.

WHENEVER there is a severe drought in New England the newspapers tell us that the great Elms in various towns have died, and that the street officers are about to cut them down. But it takes more than one summer's drought to kill an Elm that was growing vigorously when the dry weather began. Drought often kills trees the first summer after they are planted, and when they are dead beyond doubt they might as well be cut down or dug up to make room for others. But if a tree that has been for some years firmly rooted is so afflicted and starved by drought as to lose all its leaves in midsummer, that is not a sufficient reason for cutting it down. It may die the following year if nothing is done for its relief, but the rains of the coming winter and spring would probably revive it. A tree which is supposed to be killed by drought should never be cut down before the opening of the summer of the next year.

But a tree which gives signs of perishing by drought ought to receive sympathy and assistance. The wilting, turning yellow and falling of the leaves are signals of distress. Usually the tree is starving. It cannot assimilate and appropriate solid substances, and as there is no water to dissolve its food it can neither eat nor drink, and has no means of sustaining its life. But a tree of vigorous constitution, growing in its native soil, will endure a long and severe fast. Of course it will not grow while it is starved, and in time its constitution will be impaired, its strength will give way and it will die. But it should not be cut down because it is having a hard trial.

The trees that are soonest injured by drought have in most cases nearly exhausted the soil in which they stand. The treatment required is not merely a supply of water, but an improvement of the soil. Grass and weeds should be removed from the ground about the tree as far as the roots extend, and either rich loam or manure of a suitable kind should be copiously applied and partially incorporated with the surface stratum. If enough water is then given it from time to time to dissolve the new supply of food, the tree is likely not only to live, but to grow much more vigorously than before. Great numbers of trees in our towns grow very slowly, become enfeebled and perish at last, not on account of drought alone, but because of exhaustion of the soil and an inadequate food supply. The people of a town ought not to remain comfortably indifferent while the noble trees which embower their daily walks are starving to death. They should take measures for their relief. Very often it would be better not to plant so many trees unless they are taken care of afterward. In many instances, Arbor-Day planting is the ceremonious murder of beautiful young trees, which are put into the ground with songs and orations, and are, apparently, not thought of afterward.

The groups of large trees will usually be accompanied by shrubs to connect them with the lawn: Rhododendrons and other pendent evergreens are very useful for such purpose, when the turf being carried under them leaves no cutting line of border. Shrubs should not be accompanied in the same bed by such flowers as require digging, the line of border above mentioned destroying that repose and that variety of form which ought to characterize the former.—*W. S. Gilpin's "Practical Hints," London, 1832.*

California Forests and Irrigation.

NO other part of the United States has so much at stake in any proposed system of irrigation as California. Farther north there is more rainfall, and farther south and east there has been little done as yet, in horticulture, and while the mining and pastoral communities in those regions have much to gain from almost any attempt at irrigation, they have less to lose from hasty experiments or reckless legislation. As the traveler comes westward from the valleys and plains of Colorado and Utah, the gardens of the Rockies, he sees in Nevada, as in much of New Mexico and Arizona, a land indeed arid, but nevertheless a land that can wait if need be. Few wheat-fields and vegetable farms and no great commercial orchards and vineyards are yet established in this vast territory. It is chiefly the great American speculator who urges the immediate expenditure of millions of dollars to restore fertility to this Sahara of the continent. There is no need of haste; let the work be done as increasing population presses hard on its food supply.

But California has a different claim. She has developed by a marvelous chain of circumstances a group of great industries that depend not partly nor temporarily, but absolutely and forever upon two things: (1) the permanence of the remaining forests upon her mountains and (2) the adoption of the most perfect system of irrigation under the best laws that human skill and experience can devise. Unlike Nevada, Arizona, New Mexico, Texas, Montana, Idaho and Wyoming, this great commonwealth has already established orchards and vineyards, which represent potentially the most important horticultural investment in the world, and every new fire in the Sierra Pines, every new logging camp in the Redwoods, every day's delay in the passage of laws to withdraw from entry all the timber-lands that yet remain, is as much a blow at vine and tree in the valleys as if the axe were actually laid at their roots.

While the thirteen American colonies were fighting King George, the Spanish settlers of California were planting vines and Olive trees, avenues of Pear, Fig and Orange, and establishing at more than a hundred mission villages and "ranchos" plantations that a century later were to become gardens of beauty and broaden into thousands of acres of fruit trees and vines. With few exceptions these old Spanish homesteads are the centres of the famous horticultural districts of the present time. Spain, Italy, Portugal and Mexico gave of their best to the gardens of the past, and the course of the ultimate growth of California was decided by that gift. The "gold rush" and the placer mining episode were merely a summer or two of camping in the foot-hills and splashing in the bright Californian rivers. When "the boys" came back from the mountains, there were the mission wheat-fields to bid them break the broad Sacramento plains; there were the mission vines and orchards to show them the real work of the future. Then they planted 15,000,000 fruit-trees and 15,000,000 grape vines. That, at least, is what they have to-day, after numberless experiments, and having utilized the greater part of the lands that under existing conditions are perfectly well adapted to horticulture, they begin to look abroad over their own wheat fields and pastures, which have the soil and climate required, but need security of another sort. Some of the orchards and vineyards are on "sand plains," once covered with *Artemisia* and *Cactus*, but reclaimed by irrigation. Most of them, however, have merely taken the place of Willow "bottoms," Oak-forests and miles of tangled mountain shrubs, and the actual leaf-surface is hardly greater in any of the valleys than it was before the orchards were planted.

Meanwhile the forests have been cleared at a rate which has never been surpassed in any community of equal size. Wood is almost the only building material in use in California. There are a few buildings of brick and stone, but these are but the exceptions to the rule. Then, too, the great mining operations have used up the forests with frightful speed. There are miles of flumes, miles of timbering and flooring, and "blocks" in tailing races, all cut from the best part of the trunks, with the rest left to perish. The Comstock mines have used up timber enough to build a city. Every smelter's furnace clears off acre after acre, usually taking only "fine milling lumber." The building of the stamp mills requires an amount of timber that astonishes the visitor. When a miner takes up a claim he first assures himself that water and wood are in the vicinity, without which it cannot be worked. No one who only knows the ordinary wastage of forests in other regions can have any adequate conception of the enormous and increasing requirement of the miner's pursuit. If the forests were withdrawn from sale, put under capable control,

and the "timber crop" sold in the open market, the miners would soon discover that they could get along with much less and the insane waste now going on would be prevented.

I have seen the bottom of cañons in the mining region literally crowded for miles with the trunks of Pines from each of which a few "flume blocks" had been sawed, and the rest discarded, though sound to the centre. I have seen mining reservoirs made in cañons, and many acres of stately Pines and Spruces left to perish as the water rose behind the dam. No one thought that it made any difference; the supply was called "inexhaustible." About twelve years ago, while a traveling correspondent of the San Francisco *Bulletin*, I rode over the mining districts of Nevada, Placer and El Dorado Counties, a region covering an area of more than 3,000 square miles. Near one of the little mining camps I made the acquaintance of a pioneer named Rayburn, who had a saw-mill, and obtained most of his timber from Government land. One night when I sat in his cabin he asked me if I "had ever seen a Pitch-Pine-tree on fire?" "Now, that is one on the point of the ridge," he said, pointing to a stately specimen, "and I'll send Jim up to touch it off for you." Like a recent writer on forests and irrigation in one of the leading magazines, he had no conception of the Chinese fire-cracker folly of the idea of touching a match to a great Pine merely to see it blaze and fall, and it took half an hour to persuade him out of the notion of his pyrotechnic display.

The causes and extent of the forest-fires of the Pacific coast have often been discussed, but I cannot refrain from giving a bit of evidence from Professor Joseph Le Conte. In a recent conversation he referred to "one of the saddest sights" he ever beheld. It was a fire-killed forest in Oregon. "For thirty miles," he said, "I rode across a belt of timber. The trees had been magnificent Pines, few of them less than 250 feet in height. Fire had destroyed every vestige of vegetation, and in places the soil was burned out in great pits and hollows." The traveler in the Californian mountains will often come upon such fire-swept districts, where miles upon miles of forests that belong to the whole American people stand in utter ruin.

The lesson that Californians are strangely slow to learn is that the prosperity of the orchard-planted valleys depends upon the maintenance of the forest-reserves. The shortage of the Delaware peach crop of 1890 is said to have added a million dollars to the value of the California peach crop. But the limits of the possible extension of the peach industry are fixed by the condition of the high Sierras and of the upper ridges of the Coast Range. If California keeps the forests as the orchards of the mountains, gathering the annual timber crop as she gathers her annual fruitage in the valleys, then orchard belt and Pine belt will meet, and the whole state blossom, and every acre of barren waste be reclaimed at last.

Professor George Davidson, one of the most careful of observers, made a report, now almost forgotten, on the irrigation of the two great valleys, the San Joaquin and the Sacramento. This report, sent to Washington in 1876, still remains the most complete and practical study of the subject, but its suggestions have never received attention. The region under consideration, including valley and low foot-hills, covers 12,000,000 acres. Professor Davidson shows that the average rainfall in the mountains is sufficient to irrigate every tillable acre of this great district, and that the engineering problems involved are not difficult. He tabulates the catchment basins of all the streams on either side of the valleys, and shows that on the maintenance of the great forests the success of the entire system depends. First, he says, the waters must be controlled, placed under a general system of law and be irrevocably bound to the lands they irrigate. Secondly, the forest must be maintained in a systematic manner, so as to avoid waste. Thirdly, the development of a complete irrigation system must go hand in hand with a drainage system to reclaim the swamp and tule lands and carry off the surplus water from the plains. The Davidson Report, which makes a large volume of several hundred pages, illustrates the possibilities of scientific irrigation in California by the best examples of similar work in other countries, but its chief value is in the clear presentation of the necessity of utilizing the water of the Sierra if horticulture is to reach its full development in the great valley.

An ideal California is yet possible, but a few more years of neglect will forever destroy that ideal. California should be a state with one-third of its surface one vast garden and orchard, one-third occupied by great and permanent forests, yielding a revenue almost as large as that of the lowlands, and one-third snow peaks, wild Alps of rocks, high, open pastures and level tule islands reclaimed and changed into such Grass-fields as those of Holland. Everywhere there should be

sufficient water, but nowhere torrents nor uncontrolled floods. On every terraced hill should flourish the Olive and Carob, the Vine and Orange, and the miners should toil in their camps among stately Pines.

Niles, Cal.

Charles H. Shinn.

Earliness from Unripe Seed.

DR. STURTEVANT'S remarks on page 355, alluding to experiments at Geneva in growing Tomatoes from unripe seed, invite a reply, which I have delayed offering for a few days, until the different strains now growing in the garden of the Wisconsin Agricultural Experiment Station should have ripened their first fruits. A brief history of the case is this: Seed of the Cook's Favorite Tomato has been saved from very immature fruits through five seasons, the fruits being selected in every case from the plants grown from immature seed. The fruits from which the seed was saved had not attained full size, and exhibited none of the indications of ripeness.

The present season, the first fruit from the immature seed ripened on August 8th, while that from plants grown every year from thoroughly mature seed ripened August 14th, showing a gain in this case of six days in favor of the immature seed. The dates of maturity of the two selections, that is, from the immature seed and from the ripe seed, in our Geneva plantings are not at hand, but it is my impression that in some instances the gain has been greater than this. In a slightly different strain which was originated in 1889, by selecting thoroughly ripened fruits from the plants grown for three seasons from immature fruits, the first fruit ripened this season ten days in advance of that from the seed grown continuously from ripe fruit.

This experiment, including certain branches not here mentioned, has proved most interesting and instructive; and it is our intention to publish the results in detail when carried a little farther. I will only add here that the increase in earliness is accompanied by a marked decrease in the vigor of the plant and in the size, firmness and keeping quality of the fruit.

University of Wisconsin, Madison.

E. S. Goff.

The Cactus in Garden Art.

The Cactus is a curiosity, one of the wonders of the vegetable kingdom. It is unusual, and therefore always bold and striking. For this reason it is a favorite with many as an object of ornamentation in lawns, and the species are often used in composition for landscape effect. In fact, so common is this use of Cactuses that we may take them to represent a type of ornamentation which is characterized by obtrusiveness and uncommonness. This is almost universally the form adopted by those who have a shallow love of Nature. It indicates that the designer is less in sympathy with his surroundings than with other regions, and that his desires are to be satisfied only by something which appeals at once to the eye as peculiar. Such types of gardens are common. One frequently sees glaring curves, angular banks, balanced figures, piles of stones, curiosities and abundance of abnormal and unusual trees and plants, but he rarely finds a picture painted in a landscape with the same taste that the artist defines and composes on his canvas. And even when we do find a garden created in the love and appreciation of Nature we are too apt to pass it by as tame or commonplace.

It is apparent that if Cactuses are to be used in landscape work, they must be treated wholly as accessories are treated, in the same manner as we treat a rockery or anything which is out of keeping with the general spirit of the scene. They should be inconspicuous, unless near a greenhouse or in restricted areas devoted to rarities and curiosities. In this climate they should never form an integral part of the landscape, for they never combine well with greensward and trees.

But we are not to be understood as discouraging the cultivation of Cactuses. We are only protesting against the grossness of fashion and taste which is too often confounded with landscape-gardening. Fashion often springs from an inharmonious with nature, while landscape-gardening is always inspired by the genius of contiguous landscapes. As greenhouse plants, Cactuses possess many merits, and are eminently worth much more general cultivation. They possess, in a remarkable degree, curiousness and beauty, and they present an almost endless variety of forms and peculiarities. . . . The peculiarities of shape and form, combined with the great beauty of their flowers, are the very features which tend to make them common favorites for lawn decoration. But everything must have its place, and it should be borne in mind that Cactuses are valuable as Cactuses, not as elements in the landscapes of our climates.—*The American Garden.*

New or Little Known Plants.

Prunus Allegheniensis.

MANY years ago, during a visit to the late J. Roberts Lowrie, Esq., of Warriorsmark, Huntingdon County, Pennsylvania, he called my attention to a strange Plum growing along a fence-row in his neighborhood, and supposed by him to have been sown there by birds. Specimens of this Plum, which may have been in flower only, and hence hard to distinguish, were sent to Dr. Gray, who returned the name *Prunus insititia*. Thus the matter rested until, on further investigation, it proved to be not an introduced foreigner, but a new species, and was published in the March number of the *Botanical Gazette* for 1877. Recent study of the plant in its native haunts and in cultivation enables me to give the following amended description:

A shrub with straggling branches, three to five feet high, sometimes over twelve feet, and in port and form a small tree, seldom thorny; leaves obovate elliptical, acuminate, finely and sharply serrate; petioles three lines long, pubescent, as well as the midrib and bases of the veins on the lower side of the blade; flowers in umbel-like clusters of two to five, from terminal and lateral buds, coetaneous with the leaves; pedicels filiform, hairy under a lens, or smooth, a fourth to half an inch long; calyx two to three lines long, minutely pubescent, the tube obconical, the teeth oblong-ovate, obtuse and shorter than the tube; petals round-obovate, three lines long; stamens very slender, some of them as long as, or longer than, the petals; drupe globose, about four lines in diameter, dark purple, covered with a bloom; stone obliquely obovoid, with a blunt point, the one suture capped by a strong ridge, rounded and marked lengthwise by a shallow groove, the other flattish and furrowed by a deeper groove.

The species, as far as yet traced, has a limited range, occupying a territory for the most part of the wildest character. Of frequent occurrence in the north-western corner of Huntingdon County, it extends from the limestone bluffs on the Little Juniata, near Birmingham (Miss N. J. Davis), over the so-called "barrens" to Centre County on the north and Spruce Creek on the east, and thence westward over Bald Eagle Ridge and Bald Eagle Valley and the Allegheny Mountain to Clearfield County and Boon's Mountain, Elk County (McMinn).

Even as a low shrub it bears a great abundance of fruit, which seems to be exempt from the attacks of insects. These little plums have a pleasant acid taste, and are known as "sloes" by the inhabitants of the region, and sometimes used by them for making pies and preserves.

In the drawing made by Mr. C. E. Faxon to illustrate this plant (see page 429), the flowering branch was taken from a plant that bloomed this year in the Arnold Arboretum, and the branch with mature leaves and fruit was furnished by the writer.

Easton, Pa.

Thomas C. Porter.

Lilium Henryi.

AMONG the hosts of new and interesting plants collected in western China by Dr. Henry were a series of specimens of Lilies from Ichang, comprising *L. giganteum*, *L. tigrinum*, *L. longiflorum*, *L. Brownii*, and a new one which Mr. Baker named in compliment to its discoverer. Bulbs of this new species were also collected and forwarded to Kew through Mr. Ford of the Hong-Kong Botanic Gardens, and one of these is now in flower at Kew. In habit it is not unlike *L. lancifolium*, but the stem is thinner, three feet high, the leaves from one to two inches apart, each six inches long by an inch in width, the texture as in *L. lancifolium*. Dried specimens show an inflorescence a foot in width, consisting of a loose corymb of sometimes eight flowers, but the Kew plant produced only two buds, and one of these fell off before it developed. The individual flower is three inches across, the segments recurved as in *L. lancifolium*, two and a half inches long and an inch wide, channeled, very distinctly papillose on the lower part, colored bright orange-yellow with a few small spots of purple. The stamens are as long as the perianth segments, green, with yellow anthers.

Horticulturally, this Lily should prove at least as useful as *L. tigrinum* and *L. lancifolium*. The smallness of the inflorescence on the Kew plant is accounted for by the fact that the bulbs when received were small and partly decayed. Next year the plants should be much better.

Kew.

W.

New Orchids.

CYPRIPEDIUM ELINOR, N. E. Br.—A hybrid raised in the collection of Mr. Drewett, of Mill-on-Tyne, between *C. superbians* and *C. × selligerum majus*, the latter being the seed-parent, to which it bears a considerable resemblance.—*Gardeners' Chronicle*, July 12th, p. 38.

CYPRIPEDIUM YOUNGIANUM.—A hybrid raised by Messrs. F. Sander & Co., of St. Albans, between *C. superbians* and *C. Rabeleni*, the latter being the pollen parent. It is a delicately colored flower and tolerably intermediate in character. It received an award of merit from the Royal Horticultural Society on July 8th last.—*Gardeners' Chronicle*, July 12th, p. 51; July 19th, p. 81.

MASDEVALLIA SCHRODERIANA.—Exhibited by Baron Schröder at a meeting of the Royal Horticultural Society on July 8th last, when it was awarded a first-class Certificate. The flowers are described as rich crimson, the lower part, however, being white. It is said to be allied to *M. Rothschildiana*, a species also unknown to me.—*Gardeners' Chronicle*, July 12th, p. 51; July 19th, p. 81.

ZYGOPETALUM CRINITO-MAXILLARE.—A hybrid raised in the collection of Lord Rothschild, of Tring. The lip is described as violet, with a few white areas, the sepals and petals green, with bold brown spots. It was exhibited at a meeting of the Royal Horticultural Society on July 8th last, when it received an award of merit.—*Gardeners' Chronicle*, July 12th, p. 51.

CYPRIPEDIUM HOOKERÆ, var. VOLONTEANUM, Rolfe.—A very pretty Bornean introduction, which has appeared both with Messrs. F. Sander & Co., of St. Albans, and Messrs. Hugh Low & Co., of Clapton. The lip is a little constricted below the mouth, the staminode unnotched, and the broad petals much spotted on the basal half. It received an award of merit from the Royal Horticultural Society on May 28th last, when it was exhibited by Messrs. Sander as *C. Volanteum*, though, botanically, I do not think it is more than a variety of *C. Hookeræ*.—*Gardeners' Chronicle*, July 19th, p. 66; May 31st, pp. 684, 687.

ÆRIDES J'ANSONI, Rolfe.—A Burmese introduction of Messrs. Hugh Low & Co., intermediate in character between *A. odoratum* and *A. expansum*, and supposed to be a natural hybrid between them.—*Gardeners' Chronicle*, July 19th, p. 66.

MAXILLARIA LONGISEPALA, Rolfe.—A graceful and pretty species, sent from Venezuela by Monsieur Bungeoth to Messrs. Linden, L'Horticulture Internationale, Brussels. The flowers are very large, the sepals and petals light purple-brown, faintly striated with a darker shade, the lip much shorter and greener. A plate will appear in the next issue of *Lindenia*.—*Gardeners' Chronicle*, July 26th, p. 94.

MASDEVALLIA ROLFEANA.—A very pretty little species, allied to *M. demissa*, but with much larger flowers. These are deep crimson-brown, with yellow tails. It was exhibited by Messrs. F. Sander & Co., of St. Albans, at a meeting of the Royal Horticultural Society on July 26th last, when it received an award of merit.—*Gardeners' Chronicle*, July 26th, p. 106.

Kew.

R. A. Rolfe.

Foreign Correspondence.

London Letter.

NEW NEPENTHES.—Conspicuous amongst the new plants of last year was *N. Burkei*, introduced by the Messrs. Veitch, from Borneo, through their collector, Burke. It is a remarkable species in the absence of the vertical-toothed wings, which form a conspicuous feature in the pitchers of *Nepenthes* generally, and also in the form of the margin of the pitcher; moreover, it is a free grower, pitchers well and is very brightly colored. Messrs. Veitch have now obtained first-class certificates for two varieties of *N. Burkei*, both of them very distinct from the type, though still possessing its main features. The variety named *Prolifica* is certain to become a popular garden plant from its compact habit and profuse production of pitchers. The leaves are only about six inches long, by about an inch in width, whilst the pitchers are five inches long, and colored pale Apricot-yellow, with dark crimson blotches. The plant certificated was only eight inches high, yet it bore seven-teen fully developed pitchers. The other variety certificated is named *Excellens*. In habit this is more like the type, differing

from it mainly in having pitchers more inflated at the base and much more highly colored. All three deserve to rank amongst the most ornamental of *Nepenthes*. A word of praise may be set down here concerning *N. Dicksoniana*, a hybrid raised at Edinburgh, and distributed by Messrs. Veitch two years ago. It is by far the noblest of that group of *Nepenthes* represented in *N. Rafflesiana*—small plants, producing enormous, well colored pitchers, whilst the constitution of the plant is as vigorous as that of the best of the genus. In my opinion, this and *N. Mastersiana* are the two best hybrid *Nepenthes* hitherto raised.

NEW SARRACENIAS.—There are now a considerable number of hybrid *Sarracenias*, which have mostly been raised in English gardens within the last twenty years. The first to succeed in this direction was the late Dr. Moore, the Curator of the Glasnevin Botanic Gardens, who raised *N. Moorei* from

the *Sarracenias* being a yard through and as much in height. Being grown in a sunny, unshaded house, the pitchers assume most vivid colors. To recommend the species of *Sarracenias* for American gardens would be like sending coals to Newcastle, but the English-raised hybrids may not be so well known in America. Mr. Bull and Mr. Williams are the principal trade growers of these plants here.

DRACÆNA MISS GLENDENNING.—There are hundreds of varieties of colored *Dracænas*, all the progeny of *D. terminalis*, which, by the way, is green in the wild form, the color and endless variety being the outcome of high cultivation and crossing. For ordinary purposes there are few that equal *D. terminalis* as known in gardens, as it stands well, colors freely, is elegant in habit and easy to grow. Messrs. B. S. Williams & Son obtained a certificate for one named as above, and which



Fig. 53.—*Prunus Allegheniensis*.—See page 428.

N. flava, crossed with *N. Drummondii*. This was in 1872. Various combinations of species have been obtained since then, some of them beautiful additions to the genus. The latest hybrids were three which were raised in a garden at Lincoln from *N. Drummondii alba* and *N. Chelsoni*, itself of hybrid origin. These were exhibited recently at a meeting of the Royal Horticultural Society, by whom a certificate was awarded to the best of the three, which was named *S. Claytoni*. The pitchers in this were about eighteen inches high, slender, in shape similar to those of *S. Drummondii*, whilst their color was rich crimson, shaded with purple and reticulated with very dark veins. This is certainly the best colored *Sarracenia* hitherto obtained. The other two exhibited were from the same parents, but different in the form and colors of the pitchers. A collection of well-grown *Sarracenias* is about as interesting as any foliage plants can be, and almost as much may be said of them as flowering plants. All the best kinds are included in a large collection of insectivorous plants at Kew, some of

was generally voted an exceptionally elegant variety. It has narrow, tapering, arched leaves, deep green, with a broad margin of rich crimson. As a table plant it is certain to become popular.

CLIANTHUS DAMPIERI.—Whether it be due to the grafting or to the exceptional constitution of the variety, it is certain that this plant is at Kew a perfect success in the open air. It is planted in a narrow border of loam and trained against a wall looking south-east. When planted late in June the stem was only three inches high, and yet, in spite of cold, wet weather, it is now a large, well-branched plant, clothed with healthy leaves and bearing numerous clusters of its brilliant colored flowers. Nothing could be more attractive, nor apparently anything much easier to obtain, than this plant as it is now at Kew. Probably the sturdiness of the plant is the result of its being grafted on *C. puniceus*. The variety called German Flag is remarkable in having the segments which form the keel white, with a scarlet margin.

OLEARIA HAASII.—This is probably the most useful of the numerous species of this genus which have so far been introduced from New Zealand and tested in gardens in this country. At least a dozen species could be named as having larger and prettier flowers than this, but they are either too tender or too straggling in habit to obtain a place amongst first rate hardy flowering shrubs. When first introduced *O. Haasti* was cultivated in pots in the greenhouse, and it was only after about a dozen years' trial that its hardiness became generally known. In many of the best gardens in England it is now largely used both as a small specimen plant for the border and in large masses for bold effect. At Kew it is particularly effective in the form of large beds, which are now a mass of white starry flowers. It is also fine as a specimen. The plant is as compact in habit as the common Box, and it bears the knife or shears quite as well as that plant. Grouped with summer-flowering plants, such as *Liliums* and *Gladioli*, it forms a most satisfactory ground or foil. Then it possesses the exceptional quality of remaining a long time in bloom, and of being at its best in the month of August. At Kew there are several plants of it trained against a wall, and these are quite as well flowered as those in the open, and apparently as healthy. In the warmer parts of England it grows apace; I have seen it in south Wales over six feet high and eight feet in diameter. It may be propagated from cuttings with as much ease as Box.

EUCRYPHIA PINNATIFOLIA.—Although one of the handsomest of flowering shrubs or small trees, and notwithstanding its having been in cultivation in England at least ten years, this plant is yet scarcely known in ordinary gardens. In the nursery of Messrs. Veitch at Coombe it is a great attraction at this time of year, being thickly clothed with pure white flowers as large as, and shaped like, those of the St. John's Wort, its near relative. In gardens where this plant will succeed it should be well represented, for it is handsome even when not in flower. A basket of flower-branches was one of the most attractive of the exhibits at the last meeting of our Royal Horticultural Society. A word in respect to the propagation of this plant. It does not strike freely when cuttings of ripened wood are used, but if the young shoots are taken when about half ripe and placed in a little warmth they strike root in a short time.

ABIES TSUGA.—This handsome Japanese species has just obtained a first-class Certificate notwithstanding its having been introduced as far back as 1853 by the late Dr. Siebold and named *Tsuga Sieboldii*. It has the habit and general appearance of the Canadian Hemlock Spruce. It forms a pretty pot specimen as well as being an elegant conifer for small lawns, etc. It is, of course, quite hardy in England. There are good examples of it on the lawns at Kew.

TILIA EUCHLORA.—Some branches of this Lime were lately shown by Messrs. Veitch and obtained a first-class Certificate. It is a tree of striking appearance, having heart-shaped leaves fully seven inches long and wide, the texture leathery and the color a deep glossy green. Messrs. Veitch recommend it as a fine avenue tree, holding its leaves much longer than ordinary Limes. It has been introduced from Japan.

London.

W. Watson.

Cultural Department.

Preparing for Easter Flowers.

AT the late Florists' Convention in Boston, Mr. James Dean, of Bay Ridge, New York, read an essay on the Easter flower trade. The extracts which we give below comprise the more strictly cultural portions of this paper:

Three-fourths of all the Easter Lilies are now forced from bulbs of *L. Harrisii*, which is more profitable and flowers more freely than *L. longiflorum*, and the plants are not liable to come blind. They can be forced with safety at a higher temperature than plants of *L. longiflorum*, and if they are removed to a temperature of fifty degrees at night, with air during the day, two weeks before the flowers open, they will be just as firm and will yield nearly twice the number of flowers. Most of the Lily bulbs come from Bermuda in July and August. They are at once potted in a light sandy loam to which has been added about one-third of well-rotted manure. The bulbs are placed about one inch below the surface of the soil, and the pots are then set close together in a frame out-of-doors, treated to a good watering, and covered with a mulch of hay or straw to prevent the soil from drying out rapidly and save watering. They can remain out-of-doors until frost, although a degree or two of frost will not injure them. From the time they are brought into the greenhouse until New Year's, a night temperature of forty to forty-five degrees with plenty of air during

the day is all they require. After New Year's they may be removed to another house or the night temperature may be increased to sixty or sixty-five and even seventy degrees if the weather proves bad and there is little sunshine. The flower buds should be brought well above the foliage six weeks before Easter, so that one standing in the doorway of the greenhouse can plainly see all the buds. Bear constantly in mind that it is much easier to hold the flowers back by shading and giving plenty of air, which hardens and stiffens them and enables them to bear transportation, than it is to hurry them into flower by steaming the pipes and giving them warm water. Under such treatment, Lilies are fit only for the rubbish heap. Before delivery each flower should be covered separately with fine tissue paper, and the buds or unopened flowers should be treated in the same way. In fact, every plant sent out for Easter should be wrapped, for although it takes a great deal of time in the rush of Easter work there will be little complaint of flowers damaged in transportation if this precaution is used.

The Azalea is second in importance on the list of Easter plants. The most of the plants for forcing come from Ghent, reaching here in October, and although packed carefully they do not always arrive in condition to be flowered the same season. They often drop their foliage and flower buds, and then must be grown another year before flowering. The successful Easter grower never depends on his last importation of Azaleas for Easter forcing, but always carries at least one year's stock of plants ahead to meet loss or damage. The Azaleas during the winter months can be kept in a night temperature of forty degrees, with plenty of air during the day, until eight weeks before Easter. If Easter comes in March, fifty-five degrees will answer at night; if Easter comes in April, fifty degrees will suffice. It will be necessary to set some of the late varieties into heat two weeks earlier. Do not stand the plants under the shade of some convenient tree during the summer months and expect them to flower the following winter. Give them the open sunshine, plunged or planted out in a Pansy frame. If the soil is heavy add sand and leaf mould, as the Azalea delights in a light, loose soil. Mulch, but do not use manure, and water and syringe to keep down red spider. Treated thus they will make a good growth and mature their flower buds and give a good crop of flowers when they are wanted. They should be carefully housed before frost to prevent injury to the buds.

The Hydrangea is now pushing the Azalea closely for second place on the list of Easter plants. And certainly a specimen plant of *H. Otaksa*, covered with its immense clusters of bright pink flowers, is worth seeing. These flower-clusters, often measuring over twelve inches in diameter, and of a color that shows equally as well by gas as by daylight, make the plant very ornamental. Thomas Hogg is still a favorite, with its pure white flowers, and will always retain a prominent place among the plants grown for Easter. *Hydrangea rosea* deserves to be grown in all collections, although the flowers are not as large as those of *H. Otaksa*, nor is the plant such a vigorous grower. The color and the freeness with which it produces its flowers will always give it a place as a market variety. A cutting struck in March, planted out before the first of May in a good rich soil and mulched and watered regularly, will by October make a plant fit to go into a seven or eight-inch pot. The plants should not be pinched or topped after the middle of June if they are wanted for Easter forcing. They may be lifted by the 10th of October, potted in good rich soil and placed in a cold frame until New Year's, with abundant air during the day and the frames covered by night to protect them from frost. They are brought into the greenhouse at New Year's, and given a temperature of sixty degrees at night, with air during the day, for three weeks, after which the temperature is increased to sixty-five degrees at night, with little air during the day, until the flowers begin to color. Then more air is gradually given during the day and the temperature reduced at night to give bright color to the flowers and harden the plant so that it can stand out in the air without wilting, as a great many of our city florists have to display their plants in the open air in front of their stores. This rule holds good for all plants that are forced for flowers, especially so with the Hydrangea and the Rose Madame Plantier, both of which, if grown in a warm temperature and exposed without being hardened, will wilt very badly when exposed to cool air. The Hydrangea when in growth requires plenty of water and an occasional watering of liquid manure will be a benefit to the plant.

The Cytisus comes next in importance as an Easter plant. Two kinds are grown. *C. Canariensis* is best suited for decorations when large plants are required; *C. racemosus* is

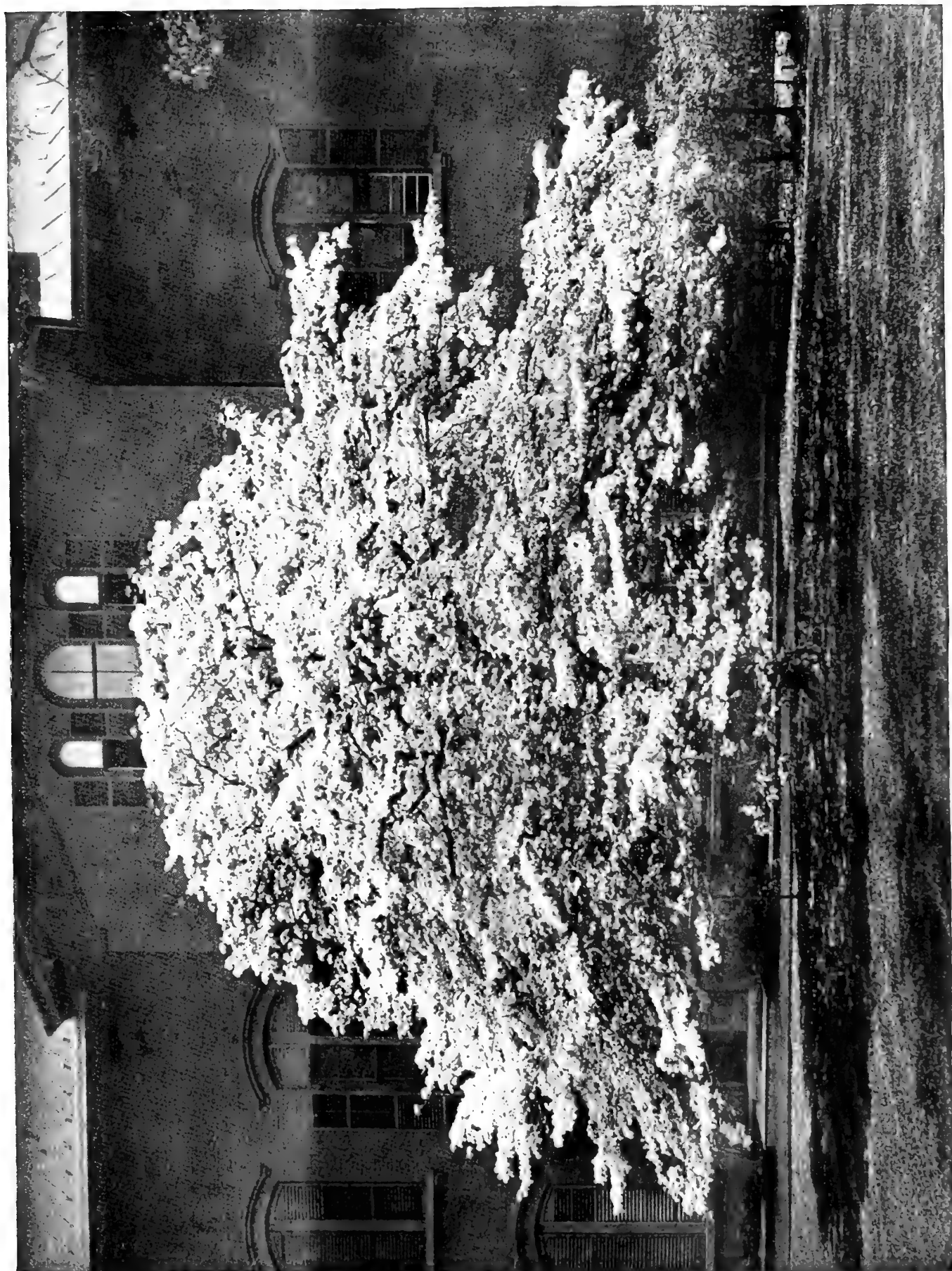


Fig. 54.—The Flowering Dogwood.—See page 425.

not of such strong growth, and is better used as small plants, kept in shape by trimming, which it stands well. The flowers are a little larger and of a deeper yellow than those of *C. Canariensis*. The plants grow freely from cuttings in a light soil to which has been added some well rotted manure. Shifted as they require they soon make salable plants if not overpotted. They should not be planted in the open ground during summer, as they lift badly, and often lose all their foliage. The plants should be plunged and mulched out-of-doors in summer, and not allowed to get dry. They can be housed the latter part of October, and will require little forcing for Easter. Forty to forty-five degrees at night with plenty of air during the day until the first of February, then fifty degrees at night with less air during the day, is the proper treatment. From the first of February they will need plenty of water, and one or two waterings with weak manure water will be of benefit, especially if the plants are in small pots.

There are other plants besides these four also largely grown, such as Spiræas, Deutzias, Callas, Roses, Rhododendrons and Geraniums; but their cultivation is well understood even by novices. Bulbs, too, are largely grown for Easter. No cultural directions are required here, although a word may be given as to the cultivation of the Lily-of-the-Valley in pots. Place fifteen pips in a five-inch pot twenty-one days before Easter and set them in the dark under the bench in a warm greenhouse for two weeks. At the end of that time they can be placed on a bench with light and air, to give the foliage its natural color and harden its flowers. Such plants make beautiful and appropriate gifts for Easter, and are in great demand.

Ferns of Singular Form.

AMONG the multitude of Ferns there are many of unique form, and having so striking an appearance as to attract the attention even of the casual observer at once. In this list may be mentioned the Stag's Horn Ferns (*Platycerium*) as among the handsomest and most noteworthy of the many good plants introduced from the South Sea Islands and Australia, and including a number of varieties, most of which are very distinct in character, while all are deserving of cultivation. The most impressive of the *Platyceriums* in general appearance is undoubtedly *P. grande*, a noble plant when well grown, and producing, in common with the other members of the genus, two distinct types of foliage, the one being barren and the other fertile and of very different form. The barren fronds are upright and sheath the base of the plant as with a shield, the upper edges of the frond being divided into numerous forks or lobes, and growing to a height of two to three feet, while the fertile fronds are thrown out at a right angle to the others, and are also divided into forked segments, so that altogether the fronds bear a striking resemblance to the antlers of certain deer. As though in keeping with the odd form of the entire plant, the seed-cases or sori are grouped together in a compact mass near the central part of the fertile frond, the seed-bearing portion sometimes being several inches in diameter and bearing some resemblance to a patch of brown Fungus.

Another fine species of more recent introduction than the above is *P. Willinkii*, a native of Java. It is of free growth even in a moderately cool fernery. This plant is not so large as *P. grande*, though the fertile fronds attain three feet in length at times, and are so covered with whitish scales as to present a frosted appearance. The barren fronds of *P. Willinkii* are somewhat similar in shape to those of *P. grande*, but not nearly so large, and seem soon to have accomplished their mission, as they begin to decay soon after their growth is completed.

P. alcorni major is a great improvement on the type, producing much larger and finer fronds, and is an excellent Fern for exhibition purposes, the fronds being deep green in color and presenting a bold and massive appearance. *P. alcorni* still remains, however, a first-rate Fern for baskets, or for rockeries, and it is doubtless the most hardy of all the *Platyceriums*.

P. Stemmaria, *P. Hillii* and *P. biforme* are other representatives of this genus, all of which grow best when suspended on a block of wood or portion of a Tree-Fern stump, the only soil necessary being some rough peat. When grown on this system frequent watering or dipping will be needed, as they dry out quickly in bright weather.

Another family of strange growth is that of the "Bird's Nest Ferns" (*Thamnopteris*), a genus having ample, entire leaves, which reach a length of from three to four feet and are about six inches in width. The leaves are glossy, a bright light

green in color and of strong texture. They are produced in a kind of whorl around the stem, thus leaving the centre of the plant open, and the crown, being more or less covered with brown chaffy scales, gives it somewhat the appearance of a bird's nest without the eggs. The best species of this genus is *Thamnopteris Australasica*, which is the easiest to manage, and, as a native of a temperate climate, it may be grown in a cool house, or even out-doors in summer if it is only placed in a shady location.

The *Menisciums* also may be classed among singular Ferns, especially *M. simplex* and *M. giganteum*, both of these having the barren fronds, simple in form and also much more ornamental than the fertile fronds, the latter being more contracted and not so enduring in quality. *M. simplex* is the smallest of the genus, so far as I am aware, the fronds being simple and the barren ones auricled or eared at the base, and about six inches in length, while the fertile fronds are entire and much smaller, the under surface being almost covered with the fruit-dots or sori. *M. giganteum* is much larger in all its parts than the one just described, though of somewhat similar character, and it will flourish with rather more heat than *M. simplex* can endure. An ordinary compost, such as is generally used for Ferns, will suit this genus, and they require an abundance of water.

Drynaria musafolia is another of the simple-leaved forms that generally attracts attention. It bears fronds somewhat like those of the *Thamnopteris* referred to above, but having the veins more sharply defined and being of a rather peculiar shade of light green. It is an evergreen plant, and was introduced from the Malayan Islands many years ago.

At least one of the so-called Filmy Ferns may be included in our short list of singular forms—namely, *Trichomanes reniforme*, which might be called the Kidney Fern, a very pretty little plant from New Zealand. It has bright green leaves, which are thrown up from a creeping rhizome, and attain a height of three or four inches.

This is not a rapid-growing plant, and requires a very open soil, such as rough peat and sand, with some broken sandstone and charcoal mixed through it.

Our native "Walking Leaf" (*Camptosorus rhizophyllus*), which is found in many localities in the northern states, though not in large quantities, is worth noting. It is also evergreen, and may well find a place in the cold fernery, where its long, narrow leaves and curious habit of reproduction from the apex of the fronds always excite interest.

Holmesburg, Pa.

W. H. Taplin.

Notes on Shrubs.

Buddleia Japonica is an east Asian plant which has been grown and disseminated under the names of *B. curviflora* and *B. Lindleyana*. These names, however, belong to other different species which would probably not be hardy in this latitude. Although *B. Japonica* is interesting in itself, it is not a shrub to be recommended for small gardens, where conspicuous and attractive blossoming is wanted, because the space can be better filled with plants of a more pleasing and ornate character. The ends of the stems of *B. Japonica* are usually more or less killed by the winters here; but this does not affect the blooming of the plant, and at the end of each new shoot a long, close raceme (sometimes nearly a foot in length) of small, tubular, light purple or lilac flowers is thrown out in July and August. The first flowers open at the base of the raceme, and, as but very few open at any one time, they never appear very showy or ornamental. By the time the terminal blossoms expand the seed-pods at the base of the raceme have become large and well developed. The stems of this plant attain a height of from four to six feet, and, when young, are sharply four-angled or winged, and the roughish looking leaves are from four to six inches long and gradually taper to a point. As the heavy racemes of fruit and flowers at the ends of the shoots give the plants a more or less drooping or pendulous appearance, they lend an added interest and variety to the shrubbery of parks or large plantations. The foliage is dense enough to completely cover the stems, and it seems very free from injuries by insects. Seed is freely and abundantly produced and is easily carried some distance by winds, and, under some favorable conditions, it germinates and grows spontaneously.

Incarvillea Olga is a half shrubby or almost herbaceous plant belonging to the Bignonia family. Originally introduced from high elevations in Turkestan, it has, without any protection, withstood the climate and winters of Boston and shown no injury. *I. Olga* annually produces new shoots from the ground, which become two or three feet in height. These stems are smooth, more or less branched and well covered

with light green pinnatifid leaves. The plants slowly spread from the roots and eventually form large clumps. In this latitude, however, the blossoming is very disappointing. The flowers are borne in racemes at the ends of the shoots, but they are usually so few in number and expand in such slow succession that they add little to the beauty of the garden. The pretty rosy pink trumpet-shaped flowers are about an inch and a half in length and nearly an inch and a quarter across the mouth, and are produced in August and September. It is possible that we have not given the plant the best conditions for fine development, because it seems to be valued in some European gardens. If very free-flowering plants should be produced from seed they ought to be perpetuated by division.

This species is the same as the one figured in the *Botanical Magazine* (t. 6539) as *I. Koopmanni*, and under this name it is still advertised in some foreign catalogues.

Arnold Arboretum.

7.

A Few Annuals.

COMET ASTERS.—The first of this distinct strain of China Asters was introduced a few years ago and met with instant appreciation, but more on account of form than coloring, which was white, lined with pink, and this color fading left the white rather turbid. However, the form was very distinct; the flat reflexed petals with blunt points, arranged rather informally, resembling very much some Japanese reflexed Chrysanthemums. Two or three years since a variety "Rose" followed, which is a great gain and one of the most pleasing of China Asters. The form is like the type, and the color is a beautiful, light, clear pink. This year we have the "Blue" Comet, which, as may be supposed, proves to be a purple, but of a very pleasing, clear light shade—a first rate variety. Both the Rose and Blue Comet Asters can be recommended for addition to the choicest collections.

CHINA ASTER PRIDE OF THE MARKET, a novelty of the season, is interesting for its precocious bloom, as it came into flower about a fortnight before the general collection sown at the same time. It is a reflexed variety, with fair-sized flowers of various colors. The stems are unusually long, and it should be a good strain for the florists. For the garden the growth is straggling, and the plant requires rather more tying up than many would be prepared to give it. However, if early flowers are wanted, this strain is well worth growing.

SWEET ALYSSUM LITTLE GEM.—This strain is a good example of what may be secured by careful seed selection. The entire lot of seedlings is dwarf and compact, without any of the legginess or weediness usual in the ordinary variety. The bloom is white and free as in the type. It is an excellent edging plant, being always in flower, and not outgrowing its bounds.

SALVIA COCCINEA, with its variety *Lactea*, are two beautiful Sages, the former a clear, deep scarlet, the latter pure white. They come true from seed; the plants are some two feet tall, much branched, with flowers borne in long spikes, and though not lasting very well when cut, are useful in bouquet making. To many this variety may prove a welcome change from *S. splendens*, which, while it is one of the most valuable and easiest grown of showy plants, is somewhat tiresome from its commonness.

CHRYSANTHEMUM MULTICAULE.—The introducer of this plant this spring frankly stated that it had been known for many years as "a botanical curiosity," and it would seem that in a botanical collection is its true place. The plants are annual and come into bloom early. It is dwarf growing, with prostrate glaucous foliage. Its flowers are single, yellow, small—an inch across—and plentiful, but only open in bright weather and in the middle of the day, so that its value for garden purposes is very slight, as we have so many better yellow Composites.

Elizabeth, N. J.

G.

Growing Pears.

THE fact that Pear culture is no longer seriously hindered by blight makes a few hints timely as to method of planting and culture. I have for many years grown Pears headed low toward the ground. To secure such I have sometimes negotiated beforehand with nurserymen to prevent their being trimmed up in the nursery. I prefer them branched out at three feet from the soil. The reasons are obvious. (1) They come to bearing as soon as dwarfs, thus saving three to five years before getting a crop. (2) For picking there is great advantage. You can gather the fruit for several years with a step-ladder. (3) All fallen fruit lies comparatively uninjured.

(4) In case of drought the limbs shade the soil and equalize temperature. It must be borne in mind that more damage to fruit occurs from severe changes of temperature than from extreme cold. (5) You are able to trim the trees as they should be without much trouble. Pear-trees should, for the first five or six years, be gone over twice a year. In midsummer cut out all superfluous shoots and suckers, and in November head back the new growth one-third.

I also have for many years grown Pear-trees as Dr. Meehan first suggested, "in grass." By that is not meant that the trees stand in sod, but that instead of being cultivated with the plow they be cultivated with the fork. Let the trees be well mulched with coarse manure or ashes of anthracite coal mixed with wood ashes. Turn this over and cleanse it of weeds once a year and thoroughly aerate it. It should be renewed once in two years. The principle is to keep the feet warm while the head is kept cool. The circle forked over should be larger in diameter each year until it is eight or ten feet across. I use weeds for mulch if other material is scarce. Sawdust is good, especially after being run through the stable for bedding.

No manure whatever should be used in planting a Pear-tree, but a top dressing of coarse manure is often needed. Some varieties require more food than others. The Seckel is a good eater and digests well. The Anjou is another. But the rule is, not to force or stimulate a Pear-tree or a Cherry-tree. But no fruit suffers worse from neglect. Choked by sod the Pear fails to bear any fruit of marketable value.

The Pear-tree is hardier than the Apple and more easily grown. Its culture is never overdone. We could find market for a hundred times the present amount grown—only we must plant with regard to seasonableness. There is a pear glut some years during September. Pears that keep long, like the Anjou, Louise, Bosc and Clairgeau, are marketable from November 1st until New Year's, and always find ready sale. All in all our grandest market as well as table pear is Anjou. It is an ideal fruit. I pick it in early October and have it till Christmas. Another Pear that I like well is Gray Doyenne.

Clinton, N. Y.

E. P. Powell.

Correspondence.

Forests and Scenery in New Hampshire.

To the Editor of GARDEN AND FOREST:

Sir.—I have recently examined portions of the White Mountain region of New Hampshire, seeing as much as possible of the scenery around Fabyan's, Crawford's, the Glen and Profile Houses and about Bethlehem. I went up Mount Washington by the stage-road from the Glen House, and came down by the railroad. I drove through the White Mountain Notch from Crawford's and went out the whole length of the Zealand Valley Lumber Railroad on a gravel train. From Fabyan's and in other places one sees on the mountain-sides extensive tracts which have been burned over, where the dead, unsightly tree-trunks destroy all the value of the scenery for the present. The sky-line, which in all fine landscapes appeals strongly to the imagination, with its suggestions of infinite distance beckoning to fairer scenes beyond the utmost range of vision, is here utterly vulgarized and degraded by these straggling ranks of decaying stumps. While these repellent objects mar the scenery it will yield no delight to visitors who seek the solace and peace of Nature among these mountains. But in a few years the dead trees will have fallen and disappeared. The slopes are already green, as they are growing up with Bush Cherry and other shrubs, which, though worthless for timber, will yet clothe the hills until the burning is repeated.

If we look at it from a few miles away, the forest still appears unbroken over a large proportion of the White Mountain region. But when we go into the woods we find a great deal of cutting, and there is much alarm among the hotel proprietors and their guests on account of the vigor with which the lumbermen are extending their operations in the vicinity of the great mountain houses. All tourists will remember the beautiful drive through the White Mountain Notch from Crawford's, shaded and embosomed under a bower of greenery, mile after mile, all the way. To what multitudes of people the coolness of these woods, and the murmurous music of their crystal waters, have given rest and delight. Now it is ruined. For a large part of the distance the woods have been cut off. The trunks of the White Birches, which rose through the green leafage like slender shafts of silver, have been cut up into suitable lengths for the market, and the tops of the trees sprawl everywhere over the ground in confusion and entanglement. The sun-glare is hot on

the road, and the air seems entirely changed. The sylvan fragrance and freshness are gone.

Everybody who visits the region ought to go up into the woods the full length of the Zealand Valley Railroad, about ten or twelve miles, taking the cars at Zealand Junction, two miles below Fabyan's. That country belongs to Messrs. J. E. Henry & Sons, lumbermen, and they have built a good standard gauge railroad, on which they bring out their timber. It would be an excellent thing if they could be induced to run excursion trains over it. They cut only down to ten inches, but the Spruces stand so thickly that in many places it is difficult to remove the large timber without destroying nearly all. I think these proprietors do the best they can to prevent the complete destruction of forest-conditions, but they are pretty nearly helpless against fire. A fire in these woods in a dry time can be controlled only by attacking it very soon after it starts, and there is no fire-police or forest-guardianship of any kind, except that of individual land-owners. The fire comes some time, and there is a considerable region along this Zealand Valley Railroad which has been burned until it is completely ruined. The soil has been washed away from the steep slopes, leaving the rocks bare and glittering. All tourists who wait for the cars at Zealand Junction should look across the narrow valley in front of the station, and note the two denuded hills or ledges of rock. Their white desolation shows what is the destiny of most of the White Mountain region if nothing is done to interfere with existing conditions and agencies. The ruin is not coming rapidly, but it is coming surely. More and more of the whole region will be cut off, and afterward burned over, till in time there will be no timber, or shade, or verdure, or springs of water in all the mountain country of northern New Hampshire.

What can be done to avert these threatened calamities? It is not easy to say. But the best way of approaching the matter that seems to be open to us in this state, is the establishment of a Board of Trustees empowered to acquire by gift from individuals or bodies of subscribers, parcels of real estate possessing special natural beauty, and to hold the same, together with funds for the maintenance thereof, free of all taxes, they to be required to open to the public all such lands, on condition that the state shall provide some adequate means for the protection of the forests on them from fire. This is about the plan of the association formed in Massachusetts a few months ago for the preservation of scenery and the care of places of historic interest. Under such an arrangement tracts of special beauty and interest near our great mountain resorts could be gradually acquired and forever preserved from spoliation.

Perhaps in time the state might be brought to help. But the first need is that of some kind of association, composed of the leading hotel men and other public spirited citizens of the state, to provide for some degree and method of co-operation. It is not likely that the state will do anything in the matter unless some of the men most directly interested in the pecuniary value of the scenery of the White Mountain region come together and arrange some method of awakening public interest and enlisting public support for a moderate and reasonable plan for the protection of the mountain forests against fire. The state might fairly be asked to provide and maintain some kind of forest-fire police service in the mountain region where the sparse and scattered population is inadequate for such a task. But all this is my personal suggestion only. It is not official and does not commit the other members of the State Forestry Commission to its support.

Some writers on the subject say the state should condemn and appropriate to public uses the entire "Presidential Range" and other extensive tracts in the mountain region. But nothing of the kind has ever been done in this country, and in this state we have not had even the beginning of the educational work which would be required to prepare the minds of the people for a proceeding of such magnitude. If we could have a few years of such preparatory work we might be able to begin in a small way (and that would be the best way) a course of action which would result in the permanent preservation of the best of our New Hampshire scenery. But I suppose that very few, even of our leading citizens, have as yet begun to consider or inquire by what methods anything in this direction might really be attempted or accomplished. Somebody's time and labor would be necessary, and much talking and conferring, writing and publishing—in short, general agitation and discussion.

If New York establishes a great State Park in the Adirondack region it will greatly stimulate attention to scenery interests in New Hampshire.

Franklin Falls, N. H.

J. B. Harrison.

Wheat and Rye Hybrids.

To the Editor of GARDEN AND FOREST:

Sir.—In connection with Mr. E. S. Carman's experiments in hybridizing and his success in producing a hybrid between Wheat and Rye, as told in the last number of GARDEN AND FOREST, it may be of interest to note that other experiments in the same direction have been attempted. At a meeting of the Botanical Society of Edinburgh, held April 8th, 1875, specimens were shown, and a paper was presented by Mr. Alexander Stephen Wilson on "Wheat and Rye Hybrids," which is printed in vol. xii., p. 186, of the *Transactions* of the Society.

Out of a large number of experiments, begun in July, 1873, on Wheat, Spelt, Rye, Barley and Oats, all of several varieties, only plants from two of the resulting seeds were selected as true hybrids. In the author's words, these were from "Wheat ovules and Rye pollen, and the whole aspect of the culm and ear is intermediate between Rye and Wheat. The elongation of the outer pales into awns midway in length between the blunt termination in Wheat and the longer needle of Rye is the most noticeable feature. The thinness of the culm is characteristic of Rye, and so is the slight villosity below the ear, not so observable now as when green. The glumes, also, are intermediate in size between those of Wheat and Rye.

"All the florets on these spikes fully opened, as if intending fertilization, and on some of the ears they did not close again. But what seem to be the most important facts regarding these hybrids are that the anthers did not open nor discharge any pollen; that the pollen was imperfectly developed and contained very little fovilla; and that the imperfect grains remain in the dried anthers. These facts are a sufficient reason why these hybrids are absolutely barren; not a single kernel having been produced. The anthers did not get blanched as empty anthers do, and instead of falling away as is usual they still remain attached, so that the imperfect pollen may be examined by breaking up an anther in a drop of water. The anthers are of Wheat size. In the ordinary fertilization of a Grass, the pollen grains continue to grow until they rupture the anther; in these hybrids this full growth of the pollen grains has been arrested."

Mr. Carman states that his hybrids are growing more fertile each year they are propagated. The above earlier hybrids would be called failures from a utilitarian point of view, and although Mr. Wilson has several other papers "On the Fertilization of the Cereals" in the *Transactions* of the Edinburgh Society, I am not aware that further attempts in hybridizing Wheat and Rye were ever made by him.

Arnold Arboretum.

J. G. Jack.

A Mysterious Conifer.

To the Editor of GARDEN AND FOREST:

Sir.—I have just visited and examined afresh in the Palace Garden at Potsdam the original specimen of *Abies Eichleri*, planted and named by my late friend Lauche. As this tree, for a long time almost forgotten, has recently been much talked of, and as its right to represent a distinct species has been contested, it may be interesting to glance at its history.

A certain mystery always hung around its origin, the exact locality which furnished the seed from which it sprung being somewhat obscure. All that was known was that it was of Caucasian origin, but this seemed indubitably established. Very recently, however, Herr Beissner and Herr Kenning made a special study of *A. Eichleri*, and according to them it is merely a false species, produced by an accidental change of seeds occurring in the consignment sent from Tiflis to Potsdam. After seriously examining all the facts which they could obtain they conclude that this tree is nothing but *A. Veitchii*, of Japan, under a new name and a Caucasian alibi. No one, it was said, had ever seen *A. Eichleri* in a state of nature. But two or three individuals were known, of which the largest, the true mother-tree and the original of Lauche, is at Potsdam, in the gardens of the State Nursery, which forms part of the royal park of Sans-Souci.

On the other hand, Herr Wilhelm Hans von Herrenhut tells us (in 1889) that the very restricted habitat of the species has just been discovered in the wild and romantic valley of Daba, near Borjon, in the Caucasus Mountains. Now, which of these contradictory statements are we to believe? On the one hand we have the testimony of much respected savants, on the other the judgment of a dendrologist as accomplished as the late Herr Lauche, reinforced by the recent discovery of Herr Hans von Herrenhut.

Dr. Dieck, who is on the point of starting for Asiatic Russia, expects to collect and to observe everywhere he goes,

especially in the Caucasus; and being more conversant than any one else with this vexed question, will, we hope, bring us back its solution.

Lauche received the seeds from Monsieur Radde, of Tiflis, that great explorer of the Caucasus, who is still living within its borders. Only a single seed germinated in 1870 or a little later. The plant which it produced so strongly resembled *A. Nordmanniana* that it was at first considered simply a variety of this; but, prematurely producing cones as early as 1881, the abnormal form could not escape the practiced eye of Lauche—they were much smaller and of a bluish black. Moreover, the silvery color of the under surface of the leaves and the very pronounced glaucescence of the young shoots clearly distinguished this conifer from *A. Nordmanniana*, which it otherwise so much resembles.

The original tree at Potsdam is now eight feet in height, with a considerable spread. No one would call it a beautiful object. Placed in a very confined position between other conifers, all of which surpass it in height and in beauty, it merely forms a large bush of irregular tufted shape, having lost its leader, and is making no haste to repair the loss. Since its first attempt at fructification it has remained sterile, so that the rare specimens to be found elsewhere have all been produced by grafting. The specimen in the Botanic Garden at Berlin has remained a dwarf not more than two feet in height. A much better specimen, and one which promises to develop admirably, stands on the Island of Scharfenberg. Its height is about seven feet, and with its fine, straight terminal shoot and its superb silvery color, it is a most attractive object.

Let us hope that we may soon see clearly through the mystery that enwraps *A. Eichleri*. Certainly the last word has not yet been said with regard to it. Lauche believed that he had good authority for the belief that in its native wilds it reaches a height of 100 feet, usually being clothed with branches down to the ground. Moreover, it seems very improbable that seeds from Japan should have strayed to Tiflis, a city so far from the great commercial routes which unite the extreme Orient to Europe. I may add that the person to whom Lauche dedicated the tree was Herr Eichler, the last Director but one of the Botanic Garden in Berlin, who died only a few years ago.

Berlin.

Carl Bolle.

Tree Peonies.

To the Editor of GARDEN AND FOREST:

Sir.—Having been much interested by the letter from Mr. Watson on the cultivation of Peonies in England, which you recently published, I venture to send a few complementary observations upon Tree Peonies.

These plants generally do very well in all soils where there is not an excess of moisture. A good ordinary agricultural soil (Wheat soil) is what suits them best, the fertilizer used being well pulverized cow manure mixed with leaf-mould. Fresh manures should be avoided as very prejudicial. These magnificent plants, as remarkable for the elegance of their foliage as for the brilliant and varied colors of their immense flowers, are all the more valuable as ornaments of the garden because they bloom at a season when flowers are still rare, long before the blossoming time of Roses. One sometimes hears the complaint that Tree Peonies do not bloom until several years after planting. Most often this results from improper methods of propagation. These shrubs, and especially certain strong-growing varieties, do not lend themselves well to rapid multiplication, and each stock normally yields but a small number of good shoots. Yet many horticulturists pitilessly take all the branches which a mother-stock can furnish in order to graft them, if possible, by single eyes. When for several years plants have suffered mutilation of this sort they produce only very small shoots, still suitable for grafting, but utterly incapable of flowering; and young plants obtained from such degenerate shoots are never vigorous; sometimes they take from seven to eight years to come into bloom, and certain individuals never bloom at all.

To obtain vigorous and floriferous plants enough shoots must each year be left on the mother plant to ensure its producing blossoms, and thus furnishing well developed cions which, for the most part, have already borne flowers. I am absolutely in accord with Mr. Watson when he says that the most vigorous plants will be those grafted on *P. Moutan*. But such grafting being little practiced on account of the almost insurmountable difficulty of getting roots large enough to receive fine grafts, we graft on the root of *P. Sinensis*; but instead of grafting a single eye at least two eyes must be taken (and even more if the eyes are very close together), and so disposed that at least one eye is beneath the surface of the

ground. This eye greatly encourages the formation of roots on the graft, and such plants draw a great part of their nourishment from their own roots. Long experience has proved that Tree Peonies thus obtained are always the most vigorous and the most floriferous; and by this method we have plants of extraordinary vigor which delight all visitors by the abundance of their blossoms.

Chenoucaux, France.

Auguste Dessert.

The Pepo of Peru.

To the Editor of GARDEN AND FOREST:

Sir.—In Feuille's "Peru," p. 735, under *Melongena laurifolia*, *fructu turbinato, variegato*, a fruit is described resembling a melon in appearance and taste, and cultivated in gardens at Lima under the vernacular name of *Pepo*. Dunal, in his *Histoire des Solanum*, identifies it with *Solanum muricatum*, Ait., with *S. scabrum*, Lam., and *S. variegatum*, Fl. Peru, as synonyms, and he adds that it also occurs in the gardens of Teneriffe.

Can any of the readers of GARDEN AND FOREST inform me whether this fruit has ever been tested in American or European culture, and whether it has merit as judged by European palates?

South Framingham, Mass.

E. Lewis Sturtevant.

Recent Publications.

The True Grasses. By Eduard Hackel. Translated from *Die Natürlichen Pflanzenfamilien* by F. Lamson Scribner and Effie A. Southworth. Pp. 236. Henry Holt & Co., New York, 1890.

This is a most interesting volume and it will be indispensable to every botanist who has a library of any pretensions. It will be found worthy of a place on the shelf beside such works as those of Sachs, De Bary, Strasburger and the *Genera Plantarum* by Bentham and Hooker. No man has a better reputation for thorough insight into the structure and classification of the Grasses than has Mr. Hackel, and the results of his patient study are shown on every page. He has taken advantage of the labors of the best agrostologists who have gone before him, whether it be Robert Brown, George Bentham or General Munro.

Part I. treats of organs of vegetation, minute structure, the ligule, the leaf-blade, leaf-torsion, nervation, inflorescence, the spikelet, the stamens, the pistil, pollination, ovule, fruit, seed, starch, means of distribution, geographical distribution and fossil grasses.

At the outset, the difference between tufted and creeping grasses is explained, the latter only being well suited for making the close, even turf so much admired in lawns and old pastures; the difference between the culm-nodes and sheath-nodes is also noted, the latter usually extending farther down the culm. On the third page we are told that the nodes are not, as is often supposed, for the purpose of giving strength to the culm, but their function consists solely in the erection of culms that have become bent down. The parenchyma of the node is geotropically sensitive, and as soon as the culm is bent over, the cells on the lower side of the node elongate, and thus the action of several nodes will again partially place the lodged grains and grasses in an erect position.

The author refers, with some explanations, to the fact that many blades of grasses are twisted one way or the other; that many, when full grown, are uniformly "bottom side up"; that most leaves have peculiar enlarged cells in the epidermis which are very sensitive to moisture and dry air. These are bulliform cells, and aid leaves in closing or "rolling" in a dry time, as in case of Indian Corn.

Part II. consists of keys of analysis and descriptions of tribes and genera. The reader of the best literature on agriculture, as well as the botanist, will find much of interest in this part of the book, which contains valuable information on the history and economic properties of grasses.

Great care has been used to secure accuracy of translation, and a very complete index gives added value to the book. The impressions of the numerous excellent cuts are well taken, and the publishers' work in general is of the best quality.

W. J. B.

Notes.

The importations of fruit into England increased a little more than a million bushels in 1871 to six and a half millions in 1888.

A statue is to be erected at Prague in honor of the famous plant collector, Benedict Roezl. It will represent him seated and at work studying a plant.

It is reported in the Agricultural Department of the *Florida Times-Union* that experiments in tanning with the Mangrove have proved very successful near Fort Myers.

The *North-western Lumberman* for August 2d publishes a sketch of the life of Mr. B. E. Fernow, Chief of the Forestry Division of the Department of Agriculture, with a portrait.

"At a farm-house in Newchurch-in-Pendle," says the *Gardeners' Chronicle*, "Mushrooms grow in profusion in the various rooms on the ground floor. A gentleman visited the place last Sunday, and he found Mushrooms growing out of the chinks of the floor and also from the walls. He was allowed to take several away, one of which was eight inches across. The Vicar of Newchurch often has a dish from the farm-house." It is interesting, but melancholy, to imagine the bodily condition of the dwellers in such a house, and also the mental condition of a clergyman who can enjoy a dainty originating in such a way.

The mantel decoration by Mr. David Allen, which took the first prize at the late exhibition of the Massachusetts Horticultural Society, was composed throughout of choice plants most tastefully arranged, from the great clusters of White Agapanthus rising above masses of Maidenhair Ferns at the base, to the exquisite Croton at the summit. The hanging sprays of Lapageria, both rose colored and white, exemplified the best use which can be made of these flowers, which keep solid and fresh so long. Beautiful Orchids and Nepenthes, *Cocos Wadeliana*, variegated Alocasias, *Adiantum Farleyense* and *Asparagus plumosus* were the other materials principally used.

Among certain remarkable trees to be found in the neighborhood of Vichy, the *Revue Horticole* notes a Black Poplar (*Populus nigra*) which stands in the park, and is called "the great tree of Vichy." The trunk measures six and a half feet in diameter at three feet above the ground, and more than thirteen feet where the huge branches diverge to form a head eighty-two feet in diameter, which attains a height of nearly ninety feet. The age of the giant is supposed to be not more than eighty years. A number of other Poplars of various sorts which stand near by, with trunks from twenty-seven to forty-three inches in diameter, and from seventy to eighty feet high, with a spread of from sixty to eighty-five feet, are remarkable specimens of rapid development, as they are known to be only twenty-seven years old.

Mr. W. R. Smith, of the Botanic Gardens, Washington, says that foreigners call *Tecoma radicans* and *T. grandiflora* "Humming Bird vines" from the fact that their flowers are constantly visited by these birds. Indeed, in one of Audubon's pictures the humming bird is feeding on the nectar of one of these Trumpet-flowers, while another species of humming bird is given in connection with the other. The flowers of *T. radicans* bloom so late that its pollen is carried by the birds to the flowers of *T. grandiflora*, and out of a large number of seedlings raised from this plant by Mr. Smith every one showed traces of the blood of our native plant. Some fine flowers of *T. grandiflora*, from the Arnold Arboretum, attracted much attention at the recent exhibition of the Massachusetts Horticultural Society in Boston.

The Boston *Transcript* says: "The amount of produce a well-managed garden is capable of yielding is well shown by the following statement recently made by G. W. Hallock & Son concerning their fifty-eight acres of land near Greenpoint, Long Island, during last year: 3,750 bushels of onions and 4,500 bushels of carrots; early cabbages, 5,500 barrels; early potatoes, 2,500 bushels; strawberries, 11,000 quarts; onions from sets, 2,260 bushels; white beans, 160 bushels; carrots, 11,000 bushels; late potatoes, 450 bushels; onions from seed, 3,900 bushels; ears of corn, 2,000 bushels; Brussels sprouts, 500 bushels; potato onion sets, 10 bushels; carrot seed, 40 pounds; onion seed, 100 pounds; Brussels sprout seed, 4 pounds; cabbage seed, 2 pounds; Hungarian grass, 3 tons; cabbage plants to carry over, 250,000."

The famous "Physic Garden" at Chelsea, London, is in danger of destruction. The Society of Apothecaries, who, for more than two centuries, have maintained it, are unwilling longer to bear the expense. In accordance with the terms of the will of Sir Hans Sloane, the ground it occupies must now be offered at the same nominal rent to the Royal Society first, and then to the College of Physicians; and, if they both refuse the charge, it can then be freely disposed of by the present heir of Sir Hans, Lord Cadogan. Once a tract of small money value, it is a desirable building site, owing to the extension of the city and the construction of the Chelsea Embankment on one side and of Battersea Park on the other. But it is to be

hoped, if only for sentimental reasons, that a garden of which Evelyn wrote in the seventeenth century, and which must be constantly quoted whenever the history of the introduction of foreign plants into England is touched upon, may be preserved during many generations to come.

In a recent number of the *Revue Horticole*, Monsieur Delabarrière described the great Rose-garden which he has created in the royal park at Laeken, and which is one of the most remarkable in the world. This *roseraie* is at once a garden to please the eye, and a school for the study of the plants, which already number more than 13,000. It forms a vast circle 430 feet in diameter, where sixteen circular beds are separated by as many pathways bordered by low, ornamental plants of other sorts, the beds being ten feet and the paths one and a half feet wide. In each bed there are three rows of Roses, so arranged with regard to their height and the color of their flowers that the general effect shall be agreeable to the eye. Four carriage-ways run from the circumference of the circle in curving lines to the centre, where they meet in a small open area. The ground slopes a little so that the plants are protected from the north wind, and, being commanded by higher portions of the park, the garden forms a delightful scene even from a distance, whence the beauty of the individual Roses cannot be appreciated.

Last winter there were many complaints of a failure of the crop of Spinach in New Jersey, and from what appeared to be a Fungus disease, and Professor Halsted in a recent bulletin from the experiment station of that state gives some account of his investigation of these diseases. Four species of parasitic Fungi were met with, a mildew, an anthracnose, a leaf blight and a white smut. Of these parasites the Anthracnose (*Colletotrichum Spinaceæ*) and the White Smut (*Entyloma Ellisi*) seem to be little known, and the former is probably the most destructive of all, being very contagious and so rapid in its development that healthy leaves showed newly developed disease-spots in six days after inoculation. Inasmuch as the whole Spinach-plant is prepared for the table it is difficult to apply remedies. Of course it is good practice to burn all affected parts of plants and not allow the refuse of the bed to get to the manure heap, and it would be also a good measure to change the location and soil of the beds, growing other crops in the old place for a few years. Perhaps it would be well if the soil were treated with the mixture of flowers of sulphur and air-slacked lime, and copper sulphate might be used upon the plants when young.

A correspondent of the *Gardeners' Chronicle* says with regard to *Chrysanthemum carinatum* recently exhibited at Chiswick by the Messrs. Hurst: "Some curious facts may be noted as to the form, color and movements of the florets. The outermost series are arranged in two or three rows of strap-shaped female florets. Within these come two or three rows of purple florets, half the length of the yellow ones and intermediate in form as in position between the true ray-florets and those of the disc, less regularly tubular than the one, less irregularly ligular than the other and female. The disc is made up, as usual, of very numerous purple, regularly tubular, hermaphrodite flowers. The fruits are deeply winged in all cases, whence the name, but while those of the two outer series have the two wings unequal in size, the wings of the innermost series of disc-florets are regular or nearly so. But these structural peculiarities are not so conspicuous or so interesting as the movements of the yellow ray-florets. In full sunshine these spread horizontally, so that the purple disc is shown surrounded by a golden aureole. As the sun goes down, down go the yellow florets too; the consequence is that the purple disc alone is visible and the yellow florets are hardly to be seen unless specially looked for. This happens when the flowers are cut and placed in water. We have had some on our study table, and have been interested to see in the morning one flower, in the evening apparently another."

Mr. Henry Bennet, widely known as the producer of seedling Roses, died on the 12th of August, at Shepperton, England. Mr. Bennet was engaged in agriculture during his early years, and in his farm practice he brought into use the same scientific precision and clear perception which he afterward employed in raising Roses. He exercised great care in selecting varieties for crossing, kept accurate records, and used a system in interbreeding which produced such fine varieties as Mrs. John Laing, Her Majesty, Princess Beatrice, Puritan, Captain Hayward and many others. There is little doubt that many other seedlings of his rearing will yet be heard from. Mr. Bennet was justly esteemed for the unassuming frankness of his disposition.

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The Army and the Forests.

AT the meeting of the American Forestry Association in Philadelphia last year a resolution was adopted to petition the Congress of the United States to pass an act withdrawing all forest-lands on the public domain from sale until a commission appointed by the President shall have made the necessary examination and reported to Congress what part of these lands should be kept permanently in forest. In accordance with these same resolutions, it was asked that the army should be employed to protect the public forest from spoliation and destruction until the Commission had reported a plan for a permanent system of forest-management. The objection which was offered to this last proposition, that the army was not large enough to perform the duties which such an enactment would impose upon it, has some weight, although we are not likely to secure any legislation in the near future which will give to the country the services of a body of forest-wardens which will approach in numbers the military forces which might be made available for this purpose.

The objection, however, that such an employment is not a proper one for the soldiery of the United States does not seem to be well taken. A conspicuous example in which the army, or rather a minute detachment of it, has served in exactly this capacity is found in the management of the Yellowstone National Park. For some reason Congress failed to make any appropriation for paying the salaries of the Superintendent of the park and his assistants for the year ending June 30th, 1887, and therefore a troop of cavalry under Captain Harris was ordered into the park. This was not a military post, and therefore the captain, who acted as Superintendent, had no right to enforce military law, his sole authority, under a special act, consisting in a power to remove trespassers from the bounds of the park. Nevertheless, the presence of the visible power of the Federal Government, as represented by this little garrison, has proved a more efficient protection to the park than could have been hoped. It is reasonable to suppose that the same moral effect would follow if the forests were placed under the control of the organized and disciplined military forces of the nation. It would not be

necessary to have a soldier ready to put out every fire and arrest every depredator. If it were once understood that the national forests were under the immediate charge of the army, and that persons who harmed them would be dealt with after the rigorous and summary processes of military law, marauders and intruders of all kinds would be deterred from any attempt at the spoliation of Government property. Under the present system, or lack of system, these attacks are invited by the assurance that there is no danger of punishment, for although the laws may seem to be rigid they are practically never enforced.

If this system of entrusting public forests to the army were not avowedly temporary, it might be worth while to consider whether the officers of the army, being men to a certain extent of scientific training, would not make the best supervisors of such a system of forest-policy as would be the best for this country. It will be many years before it will pay to go into the refinements of forest-practice here, and perhaps no body of men could be found who could be so readily prepared in the rudiments of forest-management as the officers of our army. We are ultimately to have forest-schools in this country no doubt, and that time will come when there is a demand for skilled foresters; but is it altogether an impracticable idea to add to the course in West Point some instruction in the rudiments of forestry and to establish the nucleus of the first forest-school there upon the Government reservation? Here are 2,000 acres of forest-land, and why would this not be an excellent practice-ground if some system of forest-instruction were to be given to the cadets? At all events, this large tract of Government forest-land would offer an admirable chance for lessons in the rudiments of forest-management if the woodlands on the public domain are to continue for any time under the protection of the army.

However this may be, we venture to suggest that in the reservation of public forest which is likely to be set apart by the act which has already passed the House of Representatives, and is now before the Senate, a detachment of the army would be all the protection needed for several years to come. We refer to the bill making a so-called public park in Tulare County, California, of certain designated townships which contain the remarkable grove of Sequoias to which allusion has been already made in these columns. It might have been better if this territory had been designated as a forest-reservation instead of a park. The name, however, is of little consequence if it is understood that this grove is to be kept as it now is, a primeval forest. There is not so much need of "improving" the scenery which Nature has made as there is of protecting it from desecration, and it seems to us that for the present the most efficient way in which this can be kept from desolation by fire and axe and trampling and browsing herds is to place it under the guardianship of the army. In time to come the making of roads and other works will be necessary, but there is no need of haste in this matter. The great desideratum now is protection, and it would seem that this could be provided more effectively by the army of the United States than by any other agency.

The Nomenclature of Garden Plants.

THE report of the Committee of Nomenclature at the late Convention of Florists in Boston showed that the instances in which old plants have been fraudulently sent out under new names are less numerous than has been usually supposed. The truth is that when a dealer deliberately attempts to deceive buyers the case is usually brought to public attention, and so much comment is made that the evil seems to be much more prevalent than it really is. This Committee, which, in addition to other methods of obtaining information, sent out twelve hundred circulars of inquiry, found that a large percentage of the mistakes were unintentional, and arose from mixing labels or mistaking identity in some other way easily and naturally explained. When the immense number of garden

varieties of many plants is considered, the wonder is that buyers can make their orders with such assurance that almost every plant received will be correctly named.

This weeding out of synonyms from catalogues, however, is a small portion of the work which this Committee is called upon to do, and many of the suggestions made by Mr. Reynolds and Mr. Manning were well worthy of consideration. In the first place, it is pretty clear that some rules should be laid down for the direction of all persons who name new garden-plants—rules similar to those adopted by the American Pomological Society and now observed by all who name new fruits. The rules on the nomenclature of vegetables which the Association of Agricultural Colleges proposed are also worth considering, and some of them might apply as well to flowering plants as to vegetables. For example, the name should be short, and consist, if possible, of a single word. It should not be superlative or bombastic. A plant should not be called a hybrid when it is not a product of true species, and it may be added that garden varieties should never have Latin names. One good reason for this is that since descriptive Latin terms have been used in botanical nomenclature they should not be used in the case of plants which are sufficiently distinct for garden purposes, but which are botanically identical. Besides this, the addition of varieties will bring about at last a name too cumbersome for ordinary use. Good examples of these names could be taken from almost any nurseryman's catalogue, and such combinations as *Ulmus campestris aurea Wredei* are by no means uncommon. English names are certainly to be preferred for ordinary garden varieties, and these names, as has been well held, should not be descriptive. It would not be difficult to formulate a code of rules which could be applied to the great majority of florists' plants, and there is little doubt that if some authoritative organization like this Association should promulgate these rules new plants would as a rule be named in conformity with them.

As a branch of this general question an effort is being made to bring the descriptions of plants in catalogues to greater accuracy, and here we are at once confronted with the difficulty of describing colors. It would seem that the only way to convey an accurate idea of the color of a flower is to have some chart of standard colors to which reference can be made. As an illustration of the difficulties in this regard it was stated in the Convention that a single plant was described in seventeen different colors or combinations of colors, which ranged from "pink with a white centre" through "yellow orange red" up to "velvet shaded purple." Such fearful and wonderful colors as "garnet red tinted with rosy brick" and "black amaranth marmorated chestnut brown" were given as attempts to describe accurately the tints of some flower or leaf. The sample cases of spool-silk made by the Brainerd & Armstrong Co., which have been advertised in this paper, contain more than 200 shades, but very few of them, it was said, are found practically useful in describing flowers. On another page of this issue Mr. Orcutt attempts to use the "Nomenclature of Colors" adopted by Robert Ridgeway for the use of naturalists. Of course, if one has not this system to refer to, Heliotrope-purple and orange-vermilion will not convey a precise meaning, but if these terms and others become identified with a standard print they will be of great assistance to all who wish to describe the tints of flowers.

"Whatever contributes to render the scenes of nature delightful is amongst the subjects of gardening; . . . and nothing is unworthy of the attention of a gardener which can tend to improve his compositions, whether by immediate effects, or by suggesting a train of pleasing ideas. The whole range of nature is open to him, from the parterre to the forest; and whatever is agreeable to the senses or the imagination, he may appropriate to the spot he is to improve; it is a part of his business to collect into one place the delights which are generally dispersed through different species of country.—From *Whateley's "Observations on Modern Gardening,"* 1770.

The Clark Elm.

WE have already given a picture of a typical American Elm (see p. 287), and in this number (see p. 443) we give a winter view of another characteristic form of this tree as it appears in New England, where it is known as the "Willow-tree type." It is a magnificent specimen, standing in Lexington, and known to many, for its home is amid scenes which are memorable in Revolutionary annals. It is on the premises of the Clark-Hancock house, whose history is summarized in this tablet: "Built 1698; enlarged 1734. Residence of Rev. John Hancock fifty-five years, and of his successor, Rev. Jonas Clark, fifty years. Here Samuel Adams and John Hancock were sleeping when aroused by Paul Revere, April 19th, 1775." It is within earshot, too, of the spot where Major Pitcairn called upon the Lexington rebels to throw down their arms and disperse. It was but a stripling on that day, having been set out only five years before by the Rev. Jonas Clark named in the tablet. Its age, accordingly, is about 125 years.

The trunk forks at four feet ten inches from the ground. The special divisions of the two great branches spring lightly upward in noble arches, the branchlets at the extremities sweeping the ground even in winter, while in summer when the branches are weighted down by the leaves the whole tree presents the appearance of an immense leafy dome poised upon a tremulous edge of green. The circumference of the trunk at four feet above the ground is thirteen feet five inches. The circumference of one branch at the point of furcation is eight feet seven inches, and the other branch eight feet eight inches. The height of the tree is seventy feet, and its spread is eighty-four to ninety feet.

Our illustration is from a photograph by Mr. Henry Brooks, of Medford, and the tree is one of those whose portraits will appear in the "Typical Elms and other Trees of Massachusetts," now in course of preparation by that gentleman.

Color Notes on California Wild Flowers.—I.

IN describing the colors of the following wild flowers of California, I have taken pains to compare each with the colored plates given in the "Nomenclature of Colors for Naturalists," by Robert Ridgeway, of the United States National Museum. I have matched each color as closely as I was able in the field, with fresh flowers before me, usually in considerable numbers, so as to note the range of variation in each.

This character is frequently ignored by botanists, but with cultivators of flowers it should receive very careful attention. Ridgeway's "Nomenclature," above referred to, though not wholly satisfactory and far from complete, is still our only standard authority on the subject. To secure uniformity of nomenclature no other chart can be used with safety, unless compared with Ridgeway's first. The sample-case sent out by Messrs. Brainerd & Armstrong Co. I have not seen, but if it uses a different nomenclature from our standard, it will be as mischievous as useful. Ridgeway's "Nomenclature" may be had of Messrs. Little, Brown & Co., of Boston, and should be in the hands of every one desiring accuracy in his descriptions.

California is associated in the mind with gold and "golden" flowers. Frequent in literature are references to "fields of green and gold" and "seas of golden flowers;" yet it is doubtful if the color of gold can be matched in any flower that grows. The "golden" *Eschscholtzia* is of an orange hue, and any yellow tint is golden to the popular eye.

Fritillaria biflora, familiarly called by the children around San Diego by the name of the Chocolate Lily, is an elegant plant, related to the Crown Imperial. The plant grows from a few inches to a foot or more in height, with broad base leaves and a strong leafy stem, producing from one to five large and beautiful deep claret-brown campanulate flowers, like a spray of bells. The flowers are an inch long, slightly mottled with green. It is one of the finest species in a large genus of stately and handsome flowers.

Allium fimbriatum is a pretty plant, abundant in the mountains of Southern and Lower California, bordering the Colorado Desert. It sends up a stout scape a few inches high, bearing

twenty-five or thirty showy flowers of a very dark rose-purple color—sometimes lighter. Its Mexican name is *Lavina*.

Lathyrus venustus is the very pretty wild Pea so abundant through Southern and Lower California, in the cañons and valleys near the coast. The clusters of flowers are of a bright magenta. It is frequently taken for our more magnificent *Lathyrus splendens*, which has much larger flowers of a brilliant rose-red to crimson.

Frasera Parryi is a tall, stately biennial, growing in the mountains of San Diego County, usually from two to four feet in height. The first year the plant forms a cluster of broad radical leaves, which makes a mat on the ground, and, as the leaves are usually bordered with white, the plant is quite pretty at that stage. The second season it sends up its tall panicle of curious blossoms, with a deeply four-parted, rotate corolla, each division with a glandular and fringed pit on the upper side. The flower is scarcely an inch across, white (sometimes of a slightly greenish cast), with an apple-green spot on both sides of the hairy glands; while the midveins from the glands to the apex of the divisions are Heliotrope-purple. The corolla is thickly dotted with fine spots of Heliotrope-purple. It is a curious and striking plant, well worthy of cultivation, like nearly all herewith mentioned—many of which, indeed, are in cultivation in Europe, if not in America.

The Mohave Desert, in San Bernardino County, yields a multitude of beautiful flowers, none of which probably exceed in brilliancy of coloring the orange Mariposa Tulip (*Calochortus Kennedyi*). I have only been able to compare dried specimens of this lovely flower with Ridgeway's nomenclature, by which I would describe its color as between a Chinese orange and an orange-vermilion. If I may trust my memory through the eight years since I collected this plant I should say that its color when fresh is the same as when dry. The plant seldom exceeds four to six inches in height, and produces several of its showy flowers, which are about two inches across.

A large plant of *Cereus Schottii*, from San Quintin, Lower California, is just blooming in the garden (July 7th, 1890). This gray-headed "Old Man" Cactus, known by the Mexicans as the *Carambaya*, called by some of them the *hombre viejo* or *cabeza vieja*, according to Brandegee, and in Sonora known as the *Zina*, *Sina* or *Sinita* (Schott), is a tall, stately plant ten to fifteen feet or more in height. The flower is of a delicate shade between rose-pink and flesh color, an inch long and less than an inch across, quite pretty, but very insignificant beside the huge plant that produces it.

Opuntia prolifera, the common Chollas Cactus so abundant in the vicinity of San Diego, has flowers of a wine or pomegranate purple, which are very pretty, but are so well guarded by a multitude of formidable spines as to almost repel admiration. The fruit is proliferous, the seeds almost invariably abortive. The plant forms impenetrable thickets, covering quite extensive tracts along dry water-courses, on hill-side and mesa, attaining a height of four or five feet or more, and is one of the most characteristic features in the vegetation of Southern California near the coast.

Orcutt, California.

C. R. Orcutt.

Diseases of Chrysanthemums Caused by Insects.

THE cultivation of Chrysanthemums has come to occupy such a large place in floriculture that any disease which affects their growth and beauty naturally causes annoyance if not pecuniary loss to the growers of these popular flowers. They have not been subject to many injuries in the past, the best known being caused by Aphides commonly called green or black "flies," and by a fungus or "mildew" which attacks the leaves and affects their appearance and vitality. Gardeners have learned how to avoid or combat these pests, but there is another trouble which they have suffered from for years for which no definite cause has been given.

In describing this disease of the Chrysanthemums many gardeners use the terms "blinding" or "disbudding," meaning that the ends of the branches look as if stunted, the leaves are crowded together and the internodes much shortened; and worst of all, the flower buds become abortive and the expected blossoms are not produced. It was thought that these effects might be due to minute fungi, but expert fungologists were unable to detect any fungus growth in badly affected specimens submitted to them.

It is generally the practice of gardeners to start the Chrysanthemum cuttings in frames or under glass in spring, and after danger of frost is over to transplant them to the open ground. Aphides soon become abundant on the tender terminal shoots, and these are followed by other insects of the bug family, whose relation to the Chrysanthemum is little known. Few

caterpillars or insects of other orders attack the plants. With the object of discovering if possible the cause of this blight of the flower buds, a careful examination of the Chrysanthemums in different localities about Boston was made last year and have been continued the present season. The results although incomplete show conclusively that the distortions are due to the work of bugs of one or more species, which, with their slender beaks, pierce and suck the sap of the leaves and tender stems, causing the arrest of growth and giving them the familiar tufted appearance.

Probably the worst insect—one which is more abundant on the plants than all the other species together—is a leaf-hopper (*Cicadula quadrilineata*) which was first described in 1884 by Professor S. A. Forbes in his Fourteenth Report as State Entomologist of Illinois, and which is stated to have been abundant in wheat fields and injurious to Indian corn in some parts of that state. When at rest the general color of this little insect is an iridescent light yellowish green. The head is pale yellow with black eyes, and several distinguishing but variable and small black spots in front of the head between the eyes. It is very active, and on account of its color as well as diminutive size is not easily seen either on the plants or when flying, unless close and careful attention is given.

One or two larger species of leaf-hoppers are occasionally found about the plants, but they are usually rare and very probably their presence is accidental.

The common Tarnished Plant-bug (*Lygus lineolaris*) is always present in considerable numbers and doubtless is very mischievous. The Four-striped Plant-bug (*Lygus lineatus*) punctures the young leaves and causes brown spots in them, which are often so numerous as to result in the drying and withering of the foliage. This bug is bright yellow, about three-tenths of an inch long, and has a broad and a narrow black stripe down each wing cover. Both this and the Tarnished Plant-bug feed upon a great variety of vegetation.

The Insidious Flower-bug or False Chinch-bug (*Triphleps insidiosus*) is one of the smallest bugs found on Chrysanthemums. The general color is black, but there is a broad yellowish white or light reddish band across the front half of the wing covers, while the ends appear colorless.

This little bug has a favorable record as preying upon other injurious insects, and whether it is injurious or beneficial to the Chrysanthemum has not been clearly ascertained. It is usually present in considerable numbers, and may be found, in various stages of growth, hidden in the crevices about the buds and young leaf-stalks.

Plagiognathus obscurus is common about the plants, but whether it injures them or attacks other insects is not known, as little seems to have been recorded of its habits. That it may be a serious enemy of the plants may be inferred from the fact that observation on three or four specimens of a closely allied species of bug showed that they were capable of keeping the young fronds of a Fern (*Aspidium*) in check and causing them to become stunted and brown colored. Besides these bugs several other species are occasionally found; and there are also many small flies noticeable about the plants. The flies are often of bright or metallic colors and are harmless, probably being attracted to the plants by the sweet "honey dew" from the Aphides.

Gardeners usually care more for a means of destruction than a description of an insect, so that only the names or most obvious characters of the injurious bugs are given here. The detailed and often lengthy descriptions may be found in various writings on insects.*

All of the insects named are true bugs, having no jaws, but obtaining their food by sucking the juices of plants (or, as in the case of *T. insidiosus*, the juices of other soft insects) by means of their slender beaks, which they insert within the tissue. They thus avoid taking any poison which may be applied on the leaves and which would be effectual in destroying foliage-devouring larvæ. Consequently, recourse must be had to substances which compass their destruction by suffocation. Fresh Buhach, or Pyrethrum Powder, is one of the most effective remedies against many insects of this kind, and it has the advantage of not being injurious to the plants. By the use of a hand-bellows it may be dusted on dry; or, it may be applied in a liquid form at the rate of a tablespoonful to a gallon of water. It should be dusted or sprayed forcibly, so as to come in contact with all the insects. This remedy is

* *Lygus* (= *Phytocoris*) *lineolaris*, Harris' Insects Injurious to Vegetation, pp. 203-202.

Triphleps (= *Reduvius* or *Anthocoris*) *insidiosus*, in Description of the Insects of North America, by Thomas Say, edited by J. L. Leconte, vol. i., p. 357.

Plagiognathus obscurus, P. R. Uhler, in Hayden's Fifth Annual Report of the United States Geological Survey (1872), p. 418.

considered too expensive by many people, and for such there is a cheaper and possibly more effective alternative in Kerosene Emulsion. But some care is required in the application of this, because, if too strong, it is liable to injure the foliage. The kerosene must be first mixed with milk or soap,—that it may readily become incorporated with water when diluted—soap being generally considered the better for this purpose.

In two gallons of boiling water dissolve a pound of common hard soap; after the soap is dissolved, and while still boiling, but moved from fire, add half a gallon of kerosene oil. This must be stirred briskly or churned until the oil will not rise to the top when the mixture is allowed to stand and cool. When used, this emulsion should be diluted with five or six gallons of water. It should be strongly sprayed upon and about the plants by means of a force-pump or powerful syringe. The finer and stronger the spray the better the results are likely to be, because the Cicadulas take to flight upon slight alarm, and the spray should be far-reaching enough to overtake and thoroughly wet them. Particular care should also be given to spraying the under sides of the leaves and the close tufts of foliage, because it is in such situations that a great many of the insects are concealed and carry on their worst work. If it is found by experiment that the plants will bear a stronger emulsion less water should be added, but the condition of the plants and the state of the weather are factors which have to be considered in determining this question.

The dusting or spraying should be often repeated, because, as already stated, all these insects are known to feed on other kinds of plants, and they may easily migrate from them to the Chrysanthemums. The insecticide will kill the useful aphid-eating larvæ of the "lady-bird" beetles, but this cannot be avoided. The plants would be safe if covered with fine netting or gauze stretched over light frames.

Figure *f* in the drawing represents the fly and larva of an insect which, under various names, has long been known as being very injurious to the foliage of the "Marguerite" or "Paris Daisy" (*Chrysanthemum frutescens*) and some allied species, and also to Cinerarias, Eupatoriums, etc. Last season a few were found mining in the leaves of some choice Japanese Chrysanthemums, and as it may become troublesome it is noticed here that gardeners may be on their guard against it. The larvæ or little maggots live within the tissue of the leaves, and make long, irregular burrows or mines, which are easily traced by the lighter color of the surface. These mines are often so abundant that the leaves are completely destroyed, and even where they are but few they cause serious disfigurement. To pick off and destroy the infested leaves as soon as noticed is the only remedy known. If not destroyed the little maggots change to pupæ within their mines, and soon afterward small ashy gray flies come forth, and proceed in the work of perpetuating the species and accomplishing further destruction.

These flies have been most commonly referred to as *Phytomyza nigricornis* and *P. affinis*. But Mr. F. Kowarz, of Austria, a specialist on this group of flies, after examining a number of specimens collected in the vicinity of Boston, has decided that they are a distinct species, and has proposed the name of *Phytomyza Chrysanthemi* for them. His careful and detailed description has not yet been published in this country. It is most probable that the species came with plants from Europe.

Eristalis tenax, Fig. 55 (*e*), is a fly about which there has recently been some discussion, in an entomological journal,* regarding its probable pollenization of the Chrysanthemums. On the approach of cold weather in the autumn it is often found in considerable numbers in greenhouses, where it passes the remaining days of its life in resting upon the flowers or darting about with a loud buzzing noise. In the journal referred to, Mr. John Thorpe, the well known florist, is quoted as stating that he had never seen the insects outside of his greenhouses, and never before the first week in October. They are certainly most noticeable at that time, but are to be found about a great variety of flowers in our gardens from May or June throughout the rest of the season. Among great numbers of other insects these are usually overlooked or mistaken for honey bees, to which they bear some superficial resemblance. But *E. tenax* has only one pair of wings, and is perfectly harmless, inasmuch as it can neither sting nor bite.

It is often found in our dwellings in the autumn. Around Boston, gardeners complain of injury to white Chrysanthemum blossoms by a dark fluid excrement which these flies eject on the petals, and for this reason they are usually destroyed.

They are found over a large portion of the northern hemisphere, but were first noticed in America at Cambridge, Mas-

sachusetts, in 1875. The larvæ, known as "rat-tailed maggots," live in offensive pools of mud and water. Pools around manure piles are favorite haunts; and, no doubt, the barrels and tubs of manure and water often kept in and about greenhouses for fertilizing purposes facilitate the multiplication of the insects. In the open air the flies cannot avoid distributing pollen of some kinds of flowers, although it is done in a haphazard way. Whether they are useful in pollenizing or cross fertilizing the Chrysanthemums could be determined by a few simple experiments.

The illustration is made from drawings by Mr. W. H. Denton.
Arnold Arboretum. J. G. Jack.

Plant Notes.

Pyrus nigra, Sargent.

PROFESSOR SARGENT'S notes upon *Pyrus arbutifolia* (page 416) are interesting and valuable, and I am confident that he is right in making two species out of the plants which we have thrown loosely into one. His characters of separation are well drawn and important. I have noticed the distinctions he records, and but a few moments before reading his article I had been studying my specimens, and had come to the conviction that we have two species.

His note recalls a most interesting case of synonymy. In my garden I have two plants, top-worked on *Pyrus Aucuparia*, which I bought of a leading nursery as *Amelanchier ovalis* and *A. alpina*, both of which are the *Pyrus nigra*, as I shall hereafter call our black Chokeberry. I suspect that these have been introduced from Europe under this name. The one called *Amelanchier alpina* is a slower grower than the other, with leaves somewhat narrower and less glossy above, but the differences are such as could be easily produced by cultivation. Of the same nursery I ordered a tree of the Medlar, and procured this same *Pyrus nigra*!

It may not be generally known that the Chokeberry can be used as a stock for dwarfing Apples. I have fruited the Crab Montreal Beauty on it, and have worked other Apples on it successfully. My plants were unfortunately destroyed, so that I have no knowledge of how long such plants would persist. A brief record was made of these trials in the *Country Gentleman*, 1886, page 676, and Bulletin 31, Michigan Experiment Station, page 93.

Cornell University.

L. H. Bailey.

Foreign Correspondence.

London Letter.

MUTISIA DECURRENS continues to be a success against the sunny wall of one of the museums at Kew. All the Mutisias, and this one in particular, which is the best in a garden sense, prove awkward customers under cultivation, at least in the majority of English gardens. Even at Kew, where it is now in splendid health, this is the first decided success against many equally decided failures. This week I counted on the plant fifty-three fully expanded flowers, every one at least four inches across, as elegant as the most perfect of daisy-shaped flowers, and the color a brilliant flume-like orange-yellow. If one could be certain that the plant would behave like this whenever placed against a sunny wall, he need not hesitate to plant it largely and recommend it to every one who wanted a magnificent perpetual summer-flowering wall plant. The border in which this Kew specimen has done so well is an ordinary one, and the stems are tied loosely to a wire trellis. To keep the slugs from eating off the young shoots, of which they are very fond, a mulching of small pieces of coke is placed over the ground where the shoots push up, and this acts perfectly as a protection. The climate here is not too cold for this plant, but it is possible that a hot, dry summer would be too much for it. This year has been considerably below the average in regard to sun-heat and light, and above, in regard to moisture; a bad summer for gardening generally, but good for some things, and apparently the Mutisia amongst them. I have heard of good examples of this plant having been grown in a bed along with Rhododendrons, upon which the stems were allowed to climb.

GENTIANA ASCLEPIADEA.—A mass of this plant, fully two yards in diameter and nearly a yard high, with its scores

**Entomologica Americana* (Brooklyn, New York), May, 1890; also additional notes in July number.

of stems heavily laden with rich blue flowers, is now the most attractive herbaceous plant in the rock-garden at Kew. It is planted in a moist, partially shaded position in rich loamy soil, where it has grown into its present dimensions from a small plant in about five years. Every year hundreds of seedlings spring up about it, proving that the plant is as happy and as much at home as if it were on the Swiss mountains. Indeed, it is even happier, according to Mr. Dewar, who has just re-

the plants and the size and rich colors of the flowers. They were obtained from Messrs. Hallock & Sons, of Queens, New York, who profess to have obtained them by crossing *G. Saundersii* with some of the finest popular kinds. These at Kew are not named, but they deserve to be, and the raisers may be congratulated on the excellence of their seedlings. Some of the spikes are fully six feet high, and they are well furnished with flowers, all of them larger than any *Gladiolus* we have

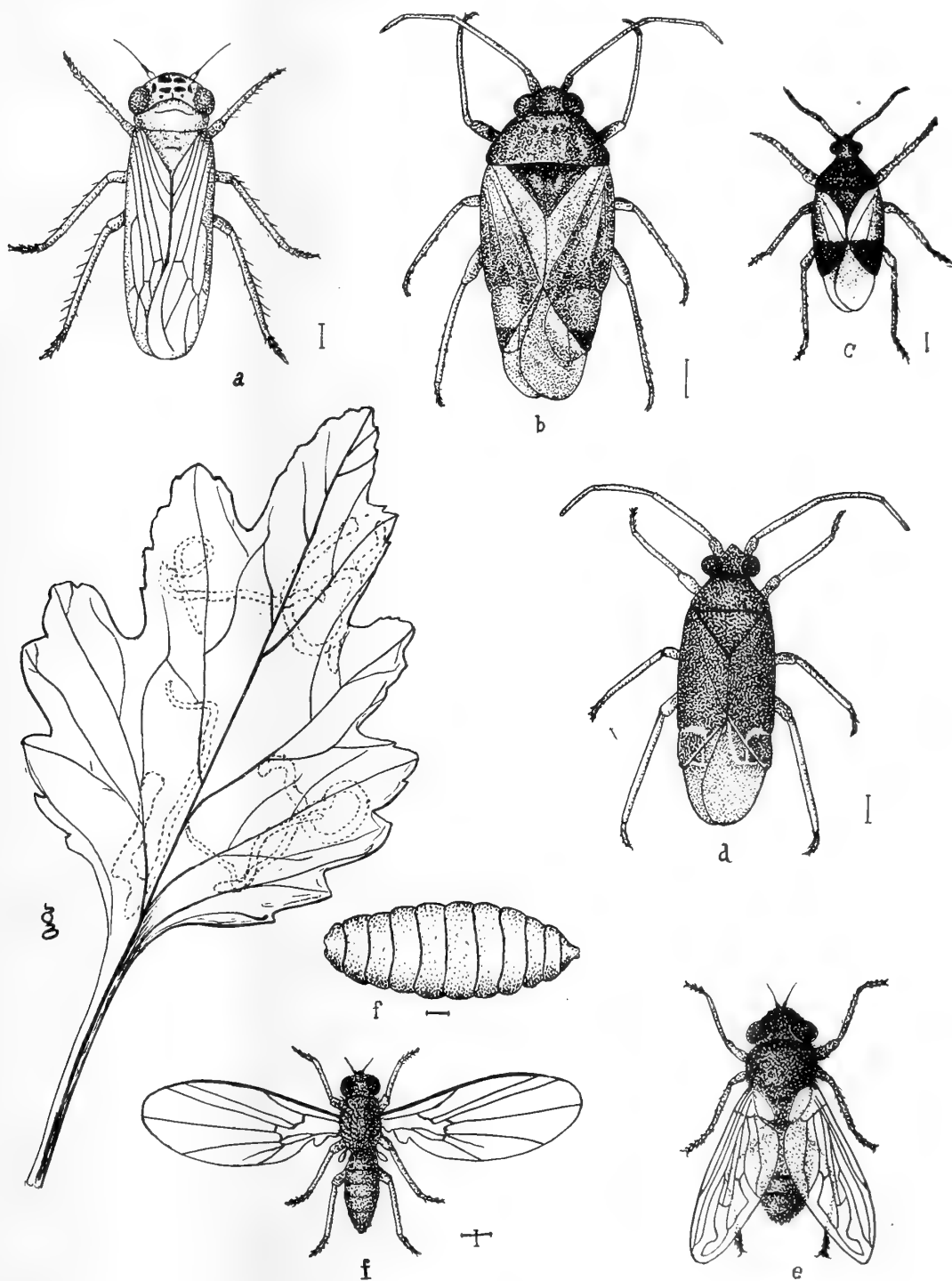


Fig. 55.—Insects Affecting Chrysanthemums.—See page 439.

- (a) *Cicadula quadrilineata*. (b) *Lygus lineolaris*. (c) *Triphleps insidiosus*. (d) *Plagiognathus obscurus*. (e) *Eristalis tenax*.
(f f) *Phytomyza Chrysanthemi* fly and larva, with *Chrysanthemum* leaf (g) showing mines of larva. All enlarged except the leaf.

turned from Switzerland, and declares that nowhere did he see this species so fine as it is under cultivation here, and he saw acres of it. In the gardens at Belvoir Castle it is equally vigorous. It ought to become a favorite for borders, or even as a specimen on lawns. There is a white-flowered variety of it.
NEW GLADIOLI.—A bed of seedling Gladioli, comprising some half a dozen kinds, now flowering finely at Kew, is attracting much attention because of the extraordinary size of

seen, whilst the colors are brilliant as well as variable. In another part of the garden there is a fine bed of the best of the hybrids raised by Monsieur Lemoine, of Nancy, from *G. purpureo-auratus* crossed with some of the *G. Gandavensis* kinds. These beautiful plants have already won a first-class reputation, their colors being exceptionally rich, the flowers large, and the plants as easy to manage as the ordinary varieties. Monsieur Lemoine also raised some hybrids from *G. Saundersii*

and *G. Gandavensis*, which are apparently very similar to those raised by Messrs. Hallock. The latter are, however, superior so far as regards the size of the flowers and the robustness of the plants, a difference which, however, may be due to the unusual size and health of the bulbs as grown in America by Messrs. Hallock. There can be no question of the beauty and decorative value of these Saundersii hybrids.

G. DECORATUS.—This is a new plant, and is one of the most beautiful of the species of *Gladiolus* known in gardens. It is now in flower for the first time at Kew, whither it was sent by a missionary in 1887 from the Usagara Mountains on the east side of Africa, near Zanzibar. Although but recently brought into cultivation, the species has been known since 1858, when Dr., now Sir John, Kirk found it while in company with Dr. Livingstone. The plant has bulbs scarcely an inch in diameter, narrow, sword-shaped leaves two feet long, and a flower spike three feet high, bearing ten flowers. These are three inches long, two inches across the mouth, the lobes recurved at the apex and the color a bright scarlet with an oblong conspicuous blotch of bright yellow on each of the three lower segments. These blotches are very ornamental. The plant appears to be quite happy under ordinary cultivation and it promises to seed freely. As a garden plant it should become a favorite on account of the distinctness and beauty of its flowers. It may also prove valuable in the hands of the hybridizer.

G. PRIMULINUS.—This was obtained from the same source as *G. decoratus* and flowered at Kew lately. It belongs to the broad-leaved, robust growing section represented by *G. draccephalus*. The flowers are as large and similar in form, but they are of a uniform pale Primrose-yellow. The plant was lately shown at a meeting of the Royal Horticultural Society. It is ornamental and should become a favorite with bulb fanciers. It may be well to mention here that to prevent possible misunderstanding, the plants sent from Kew to meetings of the Horticultural Society are not submitted to the Committee of Awards; consequently no plant from Kew ever obtains a certificate.

TRITONIAS.—These and the *Montbretias* are first-rate summer bedding plants. At Kew they are massed in circular beds eight feet across, and they make a great blaze of color from the middle of August till the end of the summer. In open places on the lawns, where they may be seen a long way off, they are very effective. They are quite hardy, and they increase so rapidly that a small clump, if well planted and let alone, will in a year or so grow into a great mass. Or, they may be lifted after flowering and dried in the same way as *Gladioli*. *T. aurea* is a well known summer flowering bulb, but the two varieties of it called *Maculata* and *Imperialis* are great improvements on the type.

MONTBRETIA POTTSII is almost as good as the *Tritonia*, but better than either is the hybrid raised from them by Monsieur Lemoine and named *T. crocosmiaeflora*. In rich soil this is almost a yard high, and the branched spikes are crowded with large orange and bronzy crimson flowers. The size of the flowers varies with the quality of the soil, but even in poor soil the plant is a success. Then there are about a dozen other named kinds from the same parents as *T. crocosmiaeflora*, but except in one or two there is not much difference between them. *Gerbe d'or* is, however, a beautiful plant, quite as tall and free-flowering as the best, the flowers being large and bright yellow. I have seen *M. Pottsii* at the foot of an old wall facing south, where it had become established, and formed a broad fringe of bright green leaves, changing in autumn to a cloud of orange-red flowers. Those here named would be equally effective in similar positions. Certainly these plants do not fill as large a place in gardens as they well might.

London.

W. Watson.

Cultural Department.

The Propagation of Hardy Herbaceous Plants.

THE time is now at hand when these plants may be propagated from cuttings and seed with the best results. It is far better to take cuttings before they have been subjected to frost and their growth checked thereby—that is, if the convenience of a greenhouse is at disposal where a temperature of fifty degrees can be maintained at night. Another advantage is, that cuttings taken now, rooted and potted, may be hardened off in a cold frame and safely wintered there with very little trouble or expense. Such plants as *Veronica sub-sessilis*, *V. amethystina*, *Anthemis tinctoria*, choice double Hollyhocks, *Heuchera sanguinea*, all the perennial Candytufts, *Amerias*, *Arabis*, *Alyssum saxatile*, *Genista tinctoria* and *G. sagittalis*, Pentstemons, *Salvias*, *Sedums*, *Desmodium pendu-*

liflorum, the perennial Peas, such as *Lathyrus latifolius* and the beautiful white variety, may be easily rooted now; the long shoots may be cut up in short pieces and they root speedily. The tufted *Phloxes* may all be rooted now and will make nice flowering plants next spring, as, indeed, will all of the above.

There is but one way to propagate the double *Lychnis Chalcidonica*, as it does not seed. We cut off the flowering stems as soon as they are past, when nice young shoots start from the base at once, and these make excellent cuttings and root readily. Of *L. viscaria*, *L. vespertina* and *L. diurna*, the double varieties all root readily. We have never found fall propagation of the tall-growing garden *Phlox* a success; they root fairly well, but winter badly, and any such plants should be lifted in fall and the young growths taken off in spring, when all will root and make strong flowering plants, and the old plants, after furnishing the cuttings, may be transferred to the border and will flower well also. The various *Dianthus*es, such as *D. plumarius*, may be carefully divided and those portions without roots used as cuttings. The choicer sorts of Clove Pinks and Scotch Pinks are best layered now and potted up later on, to be placed in the cold frame. This is necessary even though it is not desired to increase the stock, for these choice Pinks are apt to winter badly sometimes, and, moreover, one cannot well have too many or be without them altogether. With the double *Pyrethrums* our best success has always been obtained by lifting the clumps in March or when the young growth is just above ground and dividing them carefully, leaving two shoots to each portion. The other shoots may be taken off and placed in the cutting bench, where they root readily, while the rooted pieces may be potted and placed in a cold frame, and afterward transferred to the open ground in May, where all will flower, even the rooted cuttings. These *Pyrethrums* are now in great demand, and are annually imported by the thousand. Imported plants always start into growth on the voyage, and need very careful treatment on their arrival. We have found it best to pot them always, and place in a cool shady place for a few days and gradually harden them off to the sun and light, planting them out with the other things in May. The same remarks apply also to double *Delphiniums*, *Potentillas* and herbaceous *Phloxes*. It has been aptly remarked that, with importations of these plants, everything depends on the packing. Our own experience has always gone to prove the excellent way in which French goods are packed, and the many things there are yet for the English firms to learn in this matter. The freight charges on French goods are high, but the results obtained and the few losses much more than compensate for the same.

Many people may think that their gardens are already full and that there is no need of propagation; but how many are the ills that affect plants and how they seem to multiply when the specimen is an only one! How pleasant it is to know that in the reserve ground are others only waiting to take the places of such as are joining the majority or are in need of division which may check them considerably for a season, to say nothing of being able to gratify the longing glances of a friend who finds the tenth commandment very difficult to keep!

South Lancaster, Mass.

E. O. O.

The Wild Garden.

IT is the last of August and the wild garden is still brilliant with flowers. Several Sunflowers are in bloom. One of the prettiest comes from Texas—*Helianthus cucumerifolius*. It is an annual from two to three feet in height, very branching, and with glossy, shining foliage and long, slender, spotted stems, each terminated with a flower with a dark or nearly black disk, surrounded with broad, thick-set rays. It is charmingly graceful swaying in the breeze, and is beautiful as a cut flower. It commences to bloom about the middle of July and continues until frost.

Another very pretty one is a variety of *H. latiflorus*. This is a perennial and begins to blossom by the middle of June. It is little more than two feet in height, much branched, and with yellow florets, which, together with the numerous deep yellow rays, make it very conspicuous. At this date it is one mass of bloom.

A third species in flower has thick rigid leaves and yellow disk and broad rays nearly two inches in length. It is not so branching as either of the above, consequently not so many flowers on the plant, still it is quite showy and desirable. Were it not an annual I should call it *H. rigidus*.

H. angustifolius, our narrow-leaved New Jersey species, is just beginning to blossom. The leaves are long and grass-like,

with rough revolved edges. The plant is very branching and when in a good situation attains a height of six feet or more. The flowers have a dark disk and bright, almost orange-colored rays. It is later coming into flower than any other species in my garden.

The pretty Cone-flower (*Rudbeckia bicolor*) has been in blossom since July. This is a showy species from Texas with a dark cone-shaped disk and almost orange rays. It is not

flowers make a fine show during the last half of summer. And now several species of Golden Rod are beginning to add their graceful plumes among them. But the wild flowers at this season are not all yellow. The pretty little rare *Coreopsis rosea* is blooming among the Polygalas. This has rose colored rays and yellow disk. It commences to bloom about the 1st of August and continues in flower a long time. And some shrubs of the sweet scented *Clethra* are still in blossom.



The Clark Elm, Lexington, Massachusetts.—See page 438.

much above a foot in height, but is very branching, and the flowers remain fresh a long time, the rays finally withering without falling. It is an annual and from all appearance will remain in flower until frost.

Polygala lutea, with heads of bright orange about the size of Red Clover, has been in blossom all summer, and is still beautiful among the Ferns and other low growing plants.

The yellow-fringed Orchid (*Platanthera ciliaris*) is just passing out of flower. It has been charmingly beautiful and stately among the wild Lilies and Ferns. All these yellow

Pancratium coronarium, a member of the Amaryllis family and a native of the southern states, has proved hardy here and has just bloomed finely. As a pot plant it did not do very well, so several years ago I turned it out in the open ground to shift for itself, not knowing that it would survive our winters. For two or three years it showed only leaves during the summer, but now toward the last of August it sends up a fine flower scape surmounted with four delicate white fragrant flowers which remain perfect several days. The divisions of the perianth are long, linear and spreading, and the

crown is of delicate texture, large and somewhat funnel-shaped.

There is nothing in my garden that presents a more striking effect at this time than a clump of Sedge or Wool-grass (*Scirpus Eriophorum*). It is about five feet in height, with brownish or rust colored, soft woolly, great drooping panicles, and the long deep green foliage is also handsome, reaching up to the brown panicles. Other Sedges are also effective at this time. The Cotton-grass (*Eriophorum Virginicum*), with light rust colored, soft, cottony heads, is one of the best and as handsome as any flower. And the foliage of some of the wild plants is no less beautiful than flowers. The Sumachs and Sweet-gum and Sassafras and Swamp-Maples are already beginning to take on color as brilliant as the gayest flowers, while others, like the Alders, Birches, Bayberry and White Fringe, are still of the darkest, deepest green.

Vineland, N. J.

Mary Treat.

Some Native Ferns.

THE Hay-scented Fern (*Dicksonia pilosiuscula*) is the only representative we have of this genus in the United States. According to Lyell's "Hand-book of Ferns," there are twenty-nine known species of *Dicksonia* in the world, but these are mostly natives of tropical climates, Europe having but one, northern Asia one, and one in North America north of Mexico. Ours is a very beautiful Fern, about three feet high, with fronds about twice as long as the stalks, twice or rarely thrice divided. It is found from Canada to Alabama, but is not supposed to occur outside of eastern North America. It comes from creeping root-stalks and forms dense beds of its finely divided fronds. It is so abundant in many portions of the mountainous districts of New England that it is the principal pest of many mountain farms, taking almost complete possession of cleared pasture-lands which are too rough and stony for cultivation. In tillable soil it is easily kept out. Although it does well in the shade in the moist, gravelly soils of mountainous districts, it seems to prefer the sun. It is one of our most valuable Ferns for cultivation, and is more extensively grown in England, where it is highly prized, than in its native country.

Scolopendrium vulgare (Heart's-tongue) is a rare Fern in America and the only species of the genus found in the United States. There are said to be only nine distinct species in the world. This one has been found in only two or three places in North America north of Mexico. One or two of these are in New York State and one in Canada. But in Europe it is more abundant and variable. It has many forms, one English writer claiming as many as a hundred varieties. Here it is seldom over eighteen inches high by one or two inches wide; but in Europe it sometimes attains a height of nearly four feet. The single fronds are somewhat heart-shaped at the base. It is a valuable hardy Fern for cultivation, but needs to be planted in a loamy or gravelly soil in the shade. It may be transplanted in early autumn or in the spring.

Pellaea atropurpurea (Clayton's Cliff-brake) is generally considered a difficult species to grow, and all efforts to grow it with ordinary level culture seem to have failed; but if its natural locality is closely copied it is not hard to manage. It is a useful Fern for cliff-work and when once established will continue from year to year. Mr. C. G. Pringle had a plant that lived without any care for twelve years in a shaded crevice of an old wall on the north side of his house, in Charlotte, Vermont. It is an interesting and curious little evergreen, with wiry, brittle stalks from two or three inches to a foot high. It is usually found on shaded limestone cliffs in tufts of two or three stalks, to a hundred or more in large specimens. In its peculiar habitat it is found from Canada to the Rocky Mountains, and south to Alabama, Mexico and South America.

Aspidium spinulosum (Spinulose Wood Fern) is a common half evergreen species about three feet high at maturity, with oblong-lanceolate fronds about twice as long as the stalk. These are twice or three times divided, fine and pretty. There are chaffy scales the entire length of the stalk and rachis of the frond. It is found in moist, shaded woods from Newfoundland to Oregon, and south to the southern Alleghenies. There are three forms in New England, the typical species, the var. *intermedium* and var. *dilatatum*. The latter is the largest form and grows in mountainous districts. It is a good Fern for shaded slopes and is perfectly hardy. Early autumn or spring is the best time for transplanting.

The Virginia Chain Fern (*Woodwardia Virginica*) is the best bog Fern we have and will thrive in wetter locations than any other American species. It is useful for bogs, wet margins of ponds and streams, and, unlike most other Ferns, is not affected by stagnant water. In fact, it is often covered with water

in the spring or in very wet seasons, and at such times is a difficult Fern to procure from its habitat. Its height is from two to four feet, with stalks and fronds about the same length, twice divided, and from four to eight inches across at the widest part. Though not a common Fern, it is abundant enough in its peculiar localities from Canada to Florida and as far west as Arkansas. It will live in drier soil with ordinary culture, but a wet, boggy soil is its most natural home.

Southwick, Mass.

F. H. Horsford.

Notes on Shrubs.

IT has been remarked that the Japanese *Viburnum Sieboldi* did not produce much fruit in this latitude. This statement would appear to hold true only during the early years of the growth of the plant, and as it becomes older the flowers are more generally followed by fruit, as is the case with numerous other plants. *V. Sieboldi* grafted on stock of *V. dentatum*, and now over ten years old, is very freely bearing fruit in the Arboretum this season. Unlike most other species in the genus, the drupes in the compound, slightly convex cymes of this appear to ripen gradually and in slow succession, the earliest changing color and becoming soft soon after the middle of August, and the latest not showing the same evidences of maturity until the first or second week of September. The fruit is not strikingly ornamental, being light red above and greenish beneath up to the day of ripening, when it becomes black with a blue bloom and also very soft, and soon afterward it shrivels and falls off. The pulp is dark and of peculiar taste, and so intensely sweet that it is disagreeable. After handling the soft fruit, a sticky, elastic residue remains on the hands. In size and shape the drupes have some resemblance to those of the common Wayfaring-tree (*V. Lantana*), but in the latter they are usually not so regular and smooth, and the enclosed seed is much thinner and broader. This plant has been and is still sold under the name of *V. Japonicum* or *V. Japonicum latifolium*.

The rare North Carolina Huckleberry (*Vaccinium hirsutum*), of which a figure was given in the last volume of GARDEN AND FOREST (page 365), gives a promise of being valuable in cultivation here as one of the latest of its kind to ripen fruit. The little plants in the Arboretum begin to flower early in June, and the earliest berries mature in the last days of July. The best period of fruitage appears to be about the middle of August, but berries remain on the plants until early September. The hairy character of the shining black fruit would doubtless be against it for market purposes, but upon eating it the hairs are not so noticeable or objectionable as might be supposed; and in other respects the berries are very palatable, being juicy and of pleasant flavor.

Although the Cowberry (*V. Vitis-Idæa*) naturally haunts high latitudes and altitudes, being rarely found in other situations, it may be made to grow and fruit in cultivation if given a moderately moist and cool, but not too shady, place. The bright red berries begin to ripen here about the middle of August, and they have the same acid, slightly bitter and mealy quality which distinguishes them when growing wild on the White Mountains of New Hampshire. Although hardly pleasant tasted when raw, they may, with a little cooking, be made into refreshing and pleasant drinks and sauces.

When writing of *Euonymus nanus* some European writer has expressed the opinion that it probably bore little or no fruit in this country. *E. nanus*, however, fruits quite freely in the vicinity of Boston, and the seed within the pods is fully and perfectly developed. It is the earliest species of the genus to mature fruit, the pretty pink pods opening about the middle of August and disclosing the orange colored arils. The narrow, very dark evergreen foliage and the neat, compact habit of some of the best forms of this species make it a charming and attractive little shrub for using in many situations in the garden where showy blooming plants are not a desideratum.

Arnold Arboretum.

7.

Saccolabium Hendersonianum is the name of a charming little Orchid, which, unfortunately, is not seen often enough, owing chiefly to its scarcity in the market. In a few collections in England, however, it is found to grow vigorously and flower freely. From one of these collections—that of Major Mason, of Warwick—a specimen was recently sent to the meeting of the Royal Horticultural Society in London, where it was generally admired by the Orchid-loving fraternity. In habit the plant is dwarf, with distichous, strap-shaped, leathery leaves about six inches long and more or less recurved. The flowers, which are compactly arranged on a stiffish, erect raceme, and average as many as forty in number, have beautiful rosy pink

sepals and petals, the color reminding one, as Professor Reichenbach once remarked, of the flowers of a pretty West Indian Orchid—*Rodriguezia secunda*. The lip, which is in reality more in the way of a spur, is of a crystalline whiteness, occasionally tinged with pink at the tip, and is somewhat like an oblong inflated bladder between the broad lateral sepals.

There is no definite information to be found on record of the precise origin of this species, but it is generally supposed to have been first discovered by Mr. Stuart Low in Borneo as long ago as 1862. It was not, however, until about 1874 that it found its way into cultivation, and was soon after flowered for the first time in England in the nurseries of Messrs. Henderson, of St. John's Wood, a circumstance which led Reichenbach to name it in honor of that firm in due course.

Being a native of Borneo, *S. Hendersonianum* should consequently be grown in a tolerably warm and moist house. Baskets which can be suspended from the roof, so as to afford as much light as possible, are the best receptacles for the plants, with a light compost of fresh sphagnum and a little fibrous peat. Blocks or rafts may also be used, but if so, more attention to watering will be necessary. At the approach of summer, and during the entire hot season of the year, care must be taken as to shading, for many of these fleshy leaved Orchids are very susceptible to concentrated heat through glass.

Isleworth, London, W.

John Weathers.

Schubertia grandifolia.—A plant of this set in the open ground in late June is now profusely in bloom. It is a very strong grower, with semi-woody white stems. The leaves are lanceolate, some five inches long by three inches wide, and as they mature, are spotted brown. The figure by Mr. Faxon in GARDEN AND FOREST (page 369), while accurately reproducing the form of the plant, cannot, of course, give a complete expression of the beauty of the pure white flowers with the brownish calyx. The flowers are of very firm substance and of smooth surface, except just over the constricted throat, where they are furnished with numerous fine hairs one-fourth to three-eighths inches long, set horizontally. The office of these hairs would seem to be the brushing of the pollen from visiting insects. The organs of reproduction are all concealed in the swelling under the throat, and no color of anthers or stigmas relieves the white of the flower. As this plant seems to grow as well in the open air as under glass, it is likely to prove a desirable addition to open air vines (climbing by twining stems), as the appearance of foliage and flowers is pleasing. The foxy odor of the young foliage is less disagreeable in the open air than it is under glass. When the plant is in bloom the somewhat heavy, fruity odor of the flowers will perfume a large house. A well grown plant will cover a space of say three feet by twenty. It is readily propagated by cuttings or seed, from the latter of which it will come into bloom in from twelve to fifteen months.

Elizabeth, N. J.

G.

Gordonia Altamaha (pubescens).—This is one of the most beautiful of flowering trees, and just now it is in full flower here. It has been blooming for several weeks and will continue to do so until frost stops it. Philadelphia is fortunate in having a number of good specimens of this rare tree. It is to be found not only in private collections, but there are several in Fairmount Park. The original tree in Philadelphia is the one planted by Bartram himself in the historic garden in West Philadelphia which still bears his name. This tree was supposed to be dead, and in fact it did die to the ground, but on a recent visit to it I observed a sucker of several feet in length from a portion of the stump beneath the ground. It would be a most desirable thing to save this remnant of the parent tree, but as the place is now but little more than an open common, its preservation is doubtful.

In the garden of William De Hart, Woodland Avenue, Philadelphia, stands a fine example of this tree. It is, perhaps, twenty-five feet high. It is not a perfect specimen because somewhat crowded by other trees. It is, however, doubly interesting because raised by layering a branch of the original tree in Bartram's Garden. At this time of the year it often displays as many as 200 expanded flowers at once. The large, single white, Camellia-like flowers are extremely beautiful.

How far north this tree would thrive I do not know. I can say that in the hardest winters we have here it is never injured in the slightest degree, showing that it can be planted much further north than this.

The more tender species, *G. Lasianthus*, is thriving with us. Our plants have flowered profusely this year, though but two to three feet high. While very pretty, the flowers are not much more than half the size of those on *G. Altamaha*.

Germanstown, Pa.

Joseph Meehan.

The Forest.

The General Condition of the North American Forests.—I.

THE article which follows is the first part of a translation of Chapter I. of Dr. Heinrich Mayr's work, "The Forests of North America." Dr. Mayr paid two visits to this country, and his studies among our trees were made primarily for the purpose of estimating their probable economic value for introduction into German forests. It will be seen, however, that he became interested in the problems of forestry, which Americans must solve for themselves. It is well that we should know how these problems present themselves to the eye of a skilled observer from abroad, and although we may dissent from some of his conclusions and question a few of his statements, his general view of the subject in its broader lines will be accepted as correct by thoughtful readers. We hope to give the remainder of this chapter in an early number:

When the first European landed in the new hemisphere, an immeasurable area of forest lay before him: Unbroken, undisturbed, it stretched from the southernmost part of Florida to the coast of Labrador, through thirty-five degrees of latitude, and from the Atlantic coast to the borders of the prairie, fully twenty degrees of longitude. If we reckon the average length as twenty-five degrees of latitude and the average breadth as twenty degrees of longitude, we see that this primitive forest covered an area ten times as great as that of the German Empire. What exists of it to-day we can only estimate. Perhaps, however, a tenth part of the original area of primeval forest, or almost as much as the whole extent of the German Empire, still remains. In a hasty journey through this territory one receives the impression that it is almost all forest. With the exception of a few states, the forest is so conspicuous that the farms seem to occupy only a small part of the area. But a close examination of this forest reveals the fact that not more than a third part of it really deserves the name of forest; two-thirds are only scattered saplings, or a collection of isolated, gnarled, blighted trees, sometimes the last of their race.

The primeval forest grew in all soils, on the mountains as well as in the plain. No rock in the Alleghany Mountains was too steep to nourish single trees in its fissures; no soil of the plain was so poor and stony that it did not support a stately forest. Only swampy lowlands covered with water for the greater part of the year were without trees. This fact ought to be recorded for future generations; for to-day the forest in many places has been destroyed so completely that one might well doubt whether it ever existed.

Fifty years hence one who travels through the southern Pine-belt of the Gulf States will scarcely believe that the vast desert of pure snow-white sand driven hither and thither by the wind, once supported the most magnificent Pine forest in the world; no one will believe it possible that the bare, stony, steep slopes of the Alleghanies were once covered with a forest of broad leaved trees unrivaled in its variety and luxuriance. In fifty years it will seem incredible that the vast swamps of northern Wisconsin and Michigan were once covered with a thick growth of trees, and that forests of White Pine, centuries old, once swept about them.

If we turn toward the west and again in imagination pass over fifty years, we see a beneficent forest flourishing there, brought into existence by man on a plain which was once pronounced an almost useless desert. The forest was planted because the absolute necessity for it was felt. This western plantation thrives under human protection; but it is a misfortune that so many worthless kinds of wood have been planted, for the European species, from the young growth of which much was expected, are unsatisfactory as they approach maturity. It is to be regretted, too, that the production of fire-wood has been sought rather than the production of lumber by means of a more open system of planting; for, in case of necessity, timber-trees always make the best fire-wood.

Let us go still farther west. In fifty years it will be inconceivable that California, the beautiful fruit-garden of the Union, was once treeless. Amid magnificent forests of Australian Eucalyptus and Acacia the visitor will be inclined to doubt that he is really in America. The hard, sun-baked plains have been transformed into a sub-tropical garden under the influence of this delightful climate. But it has been an expensive task to dam up the turbid streams which pour down from the mountains during the rainy season,

and to divert them from the fertile plain. Much money has been sacrificed in irrigating the land, because the almost free watering of the country by means of the natural brooks from the mountains, has been made impossible by the reckless destruction of the mountain forest.

The path along which the country is advancing toward the future here depicted may now be plainly seen. In the description of the different regions, in subsequent chapters, an opportunity will present itself to prove the correctness of the gloomy, although not hopeless, forecast. Let us consider a few more facts that everywhere meet the observant traveler in America. Many treeless mountain slopes retain a little soil in the fissures of the rock-ledges with here and there sparse grass, which cattle crop from day to day. But the stumps of the trees are still there, and their roots, hanging like a spider's web over the bare rocks, show what a depth of soil, and the best of soil, has been washed away. One year has here destroyed what a hundred years cannot restore. The rain, which formerly was caught for the most part by the forests and slowly given up into the valley through the springs, flows now without hindrance into the lowlands, to devastate instead of to bring fertility. The noble mountains and valleys of the Alleghanies, of the Adirondacks and of the western mountain region are hastening with giant strides to the same fate.

Already many have raised their warning voices, but they have been regarded as dreamers; and the people have deceived themselves with the cry that the forest wealth of the country is inexhaustible. They cry the loudest who profit most by the present destructive methods, while the nation remains blind to the condition and the future of the forests. The nation is not informed about its own possessions even; much public land is officially reported as "covered with forest," from which the best timber was stolen long ago; much has been burned, and the rest is doomed to destruction in a few decades. And as if to destroy all hope for the future, fire is let loose to run through the forests every year.

The state of New York, to give an example, has, or rather claims to have, in the Adirondacks 780,000 acres of "unimproved" land, or woodland. The Commission appointed to inquire into the condition of the woods of these mountains found itself unable to settle the bounds of the public lands, because private persons claimed so much of the state woodlands as their own property. In a few districts the state has continuous woods, but commonly only in parcels less than 300 acres in extent. Nothing practically has been done by the state of New York to protect and preserve her woods. She does not even know their boundaries. Many settlers live notoriously by robbery from the state woods, and with fire and axe help the state to "improve" the woodland belonging to the people,—that is to say, to destroy the forest and the forest-soil.

Naturally it fares thus with national property under the protection of the general Government, since the nation pays no attention to the matter; indeed, the public lands are spoken of almost as if they belonged to private persons, or rather to nobody, and as if every citizen had not a legal interest in them.

As one goes westward from the metropolis in America, the perception of legal rights becomes less clear. According to the official report for the year 1883 the national Government some time ago allowed poor settlers and miners in Colorado to take wood from public land for the building of houses. The statute was liberal; the interpretation of it by the settlers was, however, still more so. Government officers who went out there after a few years, found lying in a mountain torrent half a million railway ties destined for the "domestic use" of a broad-gauge railway. Moreover, I read in the report of Mr. Fernow that the Government pays every year hundreds of thousands of dollars for the protection of the forests; but of what use is this, when the money disappears, one knows not whither, without the forest's deriving the least benefit from it?

To the honor of the present administration of the public lands, I may now add that the Government has awakened to the needs of these lands, and can boast that it has given back to the nation large quantities formerly held and used unlawfully by private persons and corporations.

In all mountain country, and poor land that has little agricultural value, on all banks of streams, as long as they are not regulated artificially, the preservation of the woods is demanded by nature for the protection of the lowlands. I am not of the opinion that it is necessary for the Government to retain land suitable for agriculture, in order to cultivate it as forest. The Government should concentrate its means and energies where its help alone can preserve a condition profitable to the people at large.

In consequence of the enormous wealth of the country and the productive power of its enterprising people, the Government has a large surplus in its treasury. I am of the opinion, which might be thought ridiculous in America, that there could be no more fitting return of part of the money to the people than to buy up the woods on the mountains and upon natural forest-land, in a word, all the forests which in the hands of individuals are doomed to destruction, and through legislation of the simplest kind, something like the system in use in India, to protect the forests against fire, to administer them through public officers, and, by means of a sufficient number of guards, to preserve them against thieves, hunters and tourists. The Government, and only the Government, can afford to make the sacrifice of present loss of interest upon the investment. In a few decades it would come back tenfold.

The consequences of the deforesting of the mountains are well known. We have the best examples of it in the Old World. Let us throw aside the delusion that all things are different in America; the laws of nature are everywhere the same. The soil may be better, the climate more favorable for tree-growing; but the disasters which have visited the Old World can only be delayed, not prevented, in the New. If the mismanagement and the burning go on in the old fashion, it needs no prophet to foretell the fate of the mountains and the land watered by their streams; America will soon have produced pictures which for grandeur of devastation cannot be surpassed by the mountains of the southern Tyrol, southern France and Spain. The Government owns numerous mountain forests, yet it strives to free itself of the burden as quickly as possible, and often at a ridiculous price. The giving away of the forests by the Government is equivalent to their ruin. It may be said that the Government even helps the destruction, although its duty is to prevent the spoliation of the land by a few at the expense of the whole people. Personal liberty and inviolability of property are fundamental ideas of the Constitution of the United States. But paying respect to the personal freedom of an unscrupulous person means trampling under foot the personal freedom of a thousand better men.

This proposition in itself justifies a demand by the nation that the mountain forests, no matter to whom they may belong, must be preserved. In order that hundreds of others may be able to have the full use of their own possessions, it is not unjust that the rights of one should be restricted. It is amusing to hear American opinions about the despotism of European governments which restrict private citizens in their right to property. The law for the protection of the mountain forests and land useless for agriculture, as well as lands upon water-courses, is made only to restrain the ignorant or unprincipled; the great majority of owners of mountain forests do not need the law at all, since they themselves are wise enough to know that in preserving the forests they are maintaining the value of their own property. If under the Constitution it is impossible to compel the individual to preserve his forest, the Government should have the right, for the good of all, to take possession of the property of a refractory citizen for a reasonable compensation, and manage it. The forests in the mountains or on the poor sandy plain which are now given away or sold, the Government in the next century will be obliged to buy back at great outlay, because the individual, unlike the Government, does not give anything away. The amount which the French Government has expended for reforesting denuded mountain slopes affords an instance of the costly character of such work. Let us hope that in the meantime all productive soil will not be washed away.

As before said, the forest must be preserved upon all kinds of land which admit only of tree-culture, especially upon dry, sandy soil and land of a swampy character. Such lands are common in America, particularly in the south, where they embrace thousands of square miles along the coast of the Gulf of Mexico and of the Atlantic Ocean. The noble forests of the finest Pines in the world have there been swept away, and the young growth destroyed by fire. The white sand already shines in its nakedness through the thin grass, the very picture of the future that I have described. With the last tree and its shade, the grass also will die. The great quantity of fructifying rain which this region receives cannot prevent the disappearance of all vegetation under this management; and only the sand will remain. Nothing is done here to check the evil and to save the land. Perhaps laws now exist for guarding the mountain forests; but laws that no one fears to set aside lightly, are worse than none. Wisconsin, Michigan and Minnesota contain extensive broad-leaved and coniferous

forests on level or gently rolling ground. Many hundred square miles of so-called swamps are covered with Larch, White Cedar (*Thuja occidentalis*), or Spruce and Balsam. Beneath low trees lie thick, damp cushions of moss, in which *Vaccinium macrocarpum*, Andromeda and other shrubs find a home. These kinds of growth owe their existence to the presence of this moss in the swampy places, because they can strike their roots in the decaying cushions above the surface of the stagnant water. If such swamps should be stripped of their trees, the cushion of moss would disappear under the influence of light, increased warmth, and the drier air; the light-loving swamp plants, Arundo, Typha and Carex, and nut-bearing shrubs, would then step into their place. Finally the soil would become sour, and be rendered unfit for use. Already many a resident in these new states can recall that this or that flag-swamp or grass-swamp, now impassable, was once covered with a forest, even if of little value. Such facts suggest to me the dark picture of the future of these rapidly developing states.

Correspondence.

To the Editor of GARDEN AND FOREST :

Sir.—Will you tell me what to plant in a dry, gravelly spot on the south side of a close fence as a screen? *Hydrangea paniculata* has flourished there during the two wet seasons just past. This year the shrubs are completely burned up and must come out.

Providence, R. I.

B.

[Privet is one of the shrubs which will grow in a very hungry soil, although it will grow much better in a deep rich one. Some species of *Elæagnus*, preferably *E. hortensis*, will grow on open gravelly banks, and so will the common Barberry if it is encouraged to start by placing some good soil about its roots. The American Beech will grow in poor, dry soil and will endure cutting well, and if held down to shrub size by the knife a Beech screen would have considerable beauty. But if the space is not very large, why not fill it in to the depth of a foot or two with good loam? Any one of a hundred shrubs could then be safely chosen.—Ed.]

Recent Publications.

Dreamthorp. A book of essays written in the country. By Alexander Smith. Rochester: George P. Humphrey.

The publisher of this dainty little volume has done a genuine service to a generation which rarely makes mention of the name of Alexander Smith. A few nervous lines from his earlier poems still linger in the memory of persons now past middle age, but even they have forgotten that after the chilling reception of "Edwin of Deira" Mr. Smith left off making verses and began to write essays. The series now published here was written from a sleepy, moss-grown town, where time ought to have been measured, as the author well says, by the silent dial rather than the ticking of a clock. Very pleasant bits of criticism of men of letters such as Montaigne and Lamb and Chaucer can be found in these pages, and much sound philosophy very pleasantly disguised in the form of light and confidential talk. But the book is noticed here chiefly on account of the fresh and delicate touches with which the scenery of this slumberous region is presented to the reader.

We do not know whether Dreamthorp was a real village or whether the garden from which and about which our author discourses had any existence outside of his imagination; but it would be hard to find a more pleasant description of a quiet inland country or of the thoughts which such scenery brings to the mind of a man of leisure in a contemplative mood.

Periodical Literature.

A Bulletin just issued by the Agricultural Experiment Station of Cornell University attempts to give some reasons for the almost total failure of the fruit crop in western New York the present year. All fruit-trees gave a wonderful profusion of bloom, and since the apple crop had been light last season a great harvest was expected this year. Heavy rains fell while the orchards were in bloom, and soon after the blossoms withered and the leaves of Apples, Pears and Quinces began to blight. The rains were succeeded by a severe drought, so that Apple orchards over thousands of acres seemed to be dying, while Quince orchards appeared to be scorched. It has been supposed that a cold rain in blooming-time will prevent fertilization of the flowers, but there is no

reason, it is said, for accepting this as generally true. As an evidence to the contrary it is stated that two Seckel Pear-trees of the same age and equally exposed, standing but a rod apart, were in bloom at the same time; one of these has no fruit now, while the other is loaded. In most cases this year the apples had set, and were as large as small peas when they withered and fell. At the same time the young leaves began to blight, and many other facts show that there was some intimate connection between the death of the flowers or young fruit and the blighting of the foliage. This blight is caused by the Apple Scab Fungus, which may have attacked the young fruits, or it may have impaired the vitality of the trees so far as to cause the fruit to fall. Some mycologists believe that this infection of the fruit takes place very early, but the blight of the leaf in many cases seems sufficient reason for the failure of the fruit. This Fungus, *Fusicladium dendriticum*, which destroys the foliage, is the same which causes the scab on the fruit. It has always been to some extent prevalent in New York, although of late years it has increased rapidly. The wet spring afforded a good condition for rapid growth. A closely related species (*Fusicladium pyrinum*), and by some regarded as identical with the other, attacks the Pear, and has no doubt caused much of the failure in the crop this year.

Upon the Quince a specific leaf blight (*Entomosporium maculatum*) has been very serious this year. It also attacks the fruit of Quince and Pear, causing them to crack. It is the same Fungus which preys upon the stocks of Pear and Quince in the nursery and renders their cultivation precarious. The trouble has become so serious in some places that Quince-growers are preparing to cut down their orchards. This leaf blight is not to be confounded with the well known and deadly Pear blight which sometimes attacks the Quince, but which is less prevalent this year than usual.

The injury to Apples, Pears and Quinces by the Scab Fungus is not vital, although it checks the growth of trees. As a rule the effect of leaf blight in western New York will probably be to develop a large crop of fruit-buds. Heavy crops have followed the failure from blight in former years, but if next spring should be wet and cool the Fungus may probably spread again as it has this year. Carbonate of copper is a sure remedy for this Fungus, and it is probably best to begin with it before the flowers open and to make from four to six applications before the 1st of August. Three should be made at any rate, one before the blossoms open and just after they fall and another three or four weeks later. Some of the Fungus can probably be destroyed by spraying even in August, but it is doubtful whether such application would pay. The Bordeaux mixture, the formula for which has often been given in these columns, is the best application for the Quince leaf blight.

The principal cause of the loss of the Peach crop this year is the curl-leaf, a Fungus disease. Nearly all the leaves crumpled and fell from Peach-trees last spring over a large extent of country, and the loss of foliage caused the death of the young fruit. New leaves soon appear and in strong trees little injury follows. No remedy is known for this affection, and it would be difficult to apply one, as the disease is so uncertain in its attacks. Whatever fruits escaped from the curl-leaf were attacked by the curculio, which is becoming very abundant, and which must be persistently fought if Peaches are to be grown in western New York. The old remedy of jarring the trees holds it in check, and Paris Green, at the rate of one pound to 350 gallons of water, applied early and often will be found useful. The worst enemy to Peach-growing in New York generally is the Yellows, a mysterious disease which can only be held in check by cutting out every affected tree. There is a law which compels Peach-growers to destroy trees affected with this disease, but it is not enforced vigorously. It is a constitutional disease, progresses slowly and is distinguished by premature fruits which bear well defined reddish spots which extend in the flesh. When the tree is not bearing, the first symptom is the appearance of yellowish, small-leaved, short shoots on the body and larger branches; afterward they appear in bunches. The tree soon becomes weak and yellowish throughout, the leaves are small and it dies in about three years. Yellows must not be confounded with yellowness. The first is a specific disease, the latter may be caused by anything which lowers the tree's vitality.

The most serious trouble with small fruits this year was the anthracnose or cane-rust of Raspberries and Blackberries. The growing canes became pitted with brownish black blotches, and on the weakened canes the berries dry up as if from drought. On the Station plantations the Shaffer plants especially were badly diseased. It is important in the treatment of this disease to keep the plants strong and healthy. They should be cultivated lightly once or twice a week until the berries begin to

ripen and after the berries are off, until well into August. There is reason to believe that this disease can be held in check by timely spraying with the Bordeaux mixture, and any treatment will be more beneficial if the diseased canes are cut and burned immediately after fruiting.

The Strawberry blight has been serious on some varieties and in some parts of the state. The most approved remedy is potassium sulphide (liver of sulphur) sprayed on the vines once in a week or ten days from the beginning of the growing season until the fruit begins to ripen. One ounce of the sulphide to eight gallons of water is the proper strength for the mixture. After the crop is gathered the plants may be mowed and burned over, or destroyed by spraying with sulphuric acid at the strength of one pint to six gallons of water. New leaves start soon and the plants are not injured.

The advent of rots and mildews in the New York vineyards is also chronicled, but it was to be expected, and no doubt these diseases will spread. The means are at hand, however, to keep these diseases easily and economically in check, and we have often given them. Professor Bailey concludes by urging upon fruit-growers the importance of a state law which looks toward the control of contagious plant diseases. New Jersey has recently passed such an act, and if some officer is empowered to look after the fruit interests under the law, an improvement in the health of orchards and vineyards may be expected.

Notes.

We received last week several clusters of the Green Mountain Grape from the Messrs. Hoyt, of New Canaan, Connecticut. The grapes were in fair-sized clusters, fully ripe, and in flavor and aroma were superior to any of the old varieties which ripen so early in the season.

Osbeck's Sumach (*Rhus semialata*, var. *Osbecki*) has been exceptionally full of flowers this year and they have but just fallen. Large greenish white panicles at the extremities of the limbs, and held well out above the clean foliage, make the tree particularly conspicuous at a season when there are few others in blossom. It is noteworthy that the bees seem to be especially attracted by the flowers.

Referring to the fact that Mr. Gilchrist named in his list of twenty native plants for florists' use (see page 423) Swamp Milkweed (*Asclepias incarnata*), a correspondent calls attention to a pure white form of the recognized var. *pulchra* of this species. This plant grows in great abundance, it is said, in Wayland, Massachusetts, along the road-side on the way to Saxonville, and is pronounced one of the best of decorative plants at this season.

Nearly fifty years ago the *Revue Horticole* thus described a gigantic Cactus—*Cereus speciosissimus*—then growing at Andilly, in the Valley of Montmorency: "It is an old plant and has been growing in the ground in a greenhouse for seven years past. It covers the whole surface of the wall, which is fifteen feet high and forty feet long. It produces every year from 1,500 to 2,000 flowers. From 400 to 800 are often seen expanded at the same time, when the effect of the rich colors is that of a glowing and superb tapestry."

A correspondent of the London *Garden* says that the trees in the gardens and squares of Edinburgh are as dingy as can be seen in any town, with the single exception of the Oriental Plane, which in the latter part of August was still conspicuous with its glossy green leaves; and it looked especially healthy among the fading Elms, Thorns, Sycamore Maples and Limes. The Elm seemed to the writer to suffer worst of all, because its rough leaf has an exceptional capacity for holding smut and dust, so that the middle-aged Elms in some of the streets were almost as black as the railings under them.

Colonel Pearson writes from Vineland that success in treating Grapes with copper sulphate for black rot and mildew has been as complete this year in that region as could be hoped. All those who have sprayed their vines with the Bordeaux mixture early and often have almost perfect crops of Concord Grapes. Most of the vineyards there, however, were stripped of their blossoms by the Rose bug, and only a few vine-growers have had the energy to spray their vineyards. Unless these precautionary measures are taken it would seem that for the present Grape-growing is impossible in infected regions.

The *United States Miller*, in describing an enormous flume recently built to bring water into the city of San Diego, California, states that its whole length is lined with redwood. As this length amounts to forty-five miles, it is difficult to compute the quantity of fine trees which must have been utilized in this

single enterprise. We may hope that less interesting species were used to build the trestle-work which bridges the valleys and ravines over which the flume passes, for the number of these is great, and no filling-in was allowed owing to the danger of landslips when this expedient is adopted instead of trestles.

The late Henry Winthrop Sargent was so famous in his day as a horticulturist and pomologist that it is interesting to find in *Downing's Horticulturalist* for the year 1847 an estimate of the varieties of fruits then growing in his garden at Wodeneth, near Fishkill. Apples are not included, as these he grew on another part of the estate, but, in addition to thirty-one varieties of foreign Grapes grown under glass, we are told of 106 varieties of Pears, sixty of Peaches, fifty-six of Plums, fourteen of Nectarines, twelve of Apricots, eleven of native Grape, twenty of Cherries, three of Quinces, six of Raspberries, four of Currants, fourteen of Strawberries and twelve of Gooseberries—all of them the choicest kinds then known.

The case against the Northern Pacific Railroad, brought by Jacob Austin several years ago, has just been decided in favor of the plaintiff by the United States Supreme Court. The cause of action was for damage to plaintiff's standing timber from a fire set by sparks from an engine. The original complaint alleged \$475 damages, but the testimony developed that more damage than that had been done, and the plaintiff asked leave to amend to \$1,000. The case went to the Supreme Court of Minnesota on the judge's affirmative ruling on this motion. It has since gone to the Supreme Court twice—three times in all—and once to the United States Supreme Court. The latter court gives the plaintiff \$750 damages, together with costs and disbursements. The total verdict is about \$1,100 for Mr. Austin.

Whether or not there are any oospores to be found in the potato-rot, *Phytophthora infestans*, is a question on which opinions are divided. Some of the British botanists accept the views of Worthington Smith, who in 1875 described bodies which he believed to be the oospores, by means of which the rot is able to survive the winter and start up again in the spring. On the other hand, German botanists generally adopted the view that the bodies in question were not the true oospores. The latest contribution on this subject is that of Dr. J. Smorawski in *Landwirthschaftliche Jahrbuecher* of the present year. In cultures of infected potatoes in specially prepared covered vessels he noticed that the mycelium not only produced conidia, but also in places swelled so as to produce oogonia-like bodies. In some cases cells were seen in contact with the oogonia, and Smorawski regards them as antheridia. But in other cases there were no antheridia, and in such cases he thinks it possible that oospores are produced in the oogonia without the action of the male, or, in other words, apogamously, to use the expression adopted by botanists. It must be said, however, that the complete development of the oospores is not figured by Smorawski, and the doubtful point with regard to the existence of oospores in the Potato-rot can hardly be said to be fully settled by Smorawski's observations.

The summer meeting of the American Forestry Association at Quebec last week drew a large attendance, including many delegates from the United States. Lord Stanley came to the meeting and made a very business-like address, as did the principal officers of the Province of Quebec. Lieutenant-Governor Angers gave some very striking figures to show how the forest-wealth of the Dominion had been squandered, while at the same time he made it clear that the Canadian method of leasing the public lands was much more satisfactory than the practice in the United States of selling forest-property outright. The Province of Quebec alone has produced since 1867 ten and a half billion feet of lumber, while the Crown timber dues during the same period had amounted to about ten millions of dollars, and during the last year the revenue from this source alone amounted to nearly a million of dollars. It is no wonder that the authorities of the Dominion are beginning to inquire how long the forests can survive such attacks. No officers were elected at this session; business of this sort will be transacted at a winter meeting which will probably be held in Washington. The discussions, as was very proper, were largely devoted to forest-interests of the Dominion, but excellent papers were read by Professor Lazenby, of Ohio; Colonel Ensign, of Colorado; N. H. Egleston, of Washington; Gen. James Grant Wilson, of New York; H. G. Joly, of Quebec; William Little, of Montreal; M. Vilmorin, of Paris; H. B. Ayres, of Minnesota, and B. E. Fernow. It is our purpose to publish abstracts of some of these papers at an early day.

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Preparation for Planting Trees.

THE placing of a young tree in the ground after all preparation for it has been carefully made is the work of a few minutes only. As a rule, the proper season for this operation in latitudes north of this city is in the Spring; but it is a fatal error to delay all preparation until April or May. These preliminary steps require time, and they should be taken with deliberation and care, so that it is not a day too early to make a beginning. In the first place, a careful study of the grounds should be made and the precise spot selected where each tree is to stand. The need for such a study would seem to be self-evident, but, as a matter of fact, the amateur too often waits to purchase his trees until the time for planting has actually arrived, and then he sends for a number of such varieties as he or his friends consider handsome, and after his trees have been delivered on the ground he sets about hunting places to plant them. Of course, in the rush and pressure of spring work everything must be done hastily and carelessly, and too often all the work is worse than wasted.

When the positions have been selected and the proper varieties of trees have been decided upon, it will pay the planter to visit some good nursery and make his own selection from among the growing trees of first-rate and thrifty specimens. He then can make his order intelligently, and he should insist that the trees he has chosen should be lifted from the nursery rows and forwarded to him as soon as possible after the leaves have ripened. Upon their arrival, any bruises which the roots have received should be carefully cut away and the young trees should be heeled in and left till spring. This operation should be performed as thoroughly as the act of final planting. A well drained place well sheltered from the wind should be selected, and fine mellow earth should be sifted among the roots and firmly packed about them. When practicable, a mound should be raised about the stems of the trees, and, if it is beaten smooth, the mice will rarely trouble them during the winter, as they do not like to climb up steep banks under the snow. When the trees are heeled in with care calluses will form where the

roots have been cut and white rootlets will at once be thrown out in the warm earth, and they will furnish a supply of moisture to the trees and prevent their drying out in winter.

By all means the ground where the trees are to be finally placed should be prepared in autumn. This means that a hole should be dug to the depth of three feet, and if the trees are such as grow to a large size there is little danger of making it too spacious. No thrifty tree is in danger of having too much nutriment, and if the hole is five or six yards across no injury will be done. After it has been dug the loam should be shoveled back and the coarse stones picked out, so that in the spring the ground will have become firmly settled. If this work is delayed until planting-time, and a deep hole is then dug, the loose earth will settle away from the roots of the tree and leave air-spaces, which may prove fatal. In the spring small holes should be made in the centre of the large ones, but of ample size to contain all the roots of the tree without bending or cramping. The young trees should then be carefully lifted from their wintering-places, so that the fibrous roots will not be disturbed, and they should be set with all care, as has been often explained in these columns, special pains being taken to have the soil rammed compactly about the roots.

Of course, many trees are successfully planted in autumn; and it is often said that whether spring-planting or autumn-planting is to be preferred depends upon the season. If trees are planted in the fall they should be moved as soon as the leaves have ripened, so that young rootlets will form before the ground freezes. The plan here recommended, however, is safe in any year, and leaves the trees in the best condition to withstand a hard winter or a dry summer. There is nothing novel in the instructions given, and we repeat them now simply because the time is at hand when preparation should begin, and because every year brings a new crop of failures on the part of novices whose delays make success impossible. What is especially insisted on is that every single process in the planting should be done in season and done with care. This means that the planter should be able to give an intelligent reason in every case why a given species or variety has been selected and why it has been placed precisely where it stands. It means that no tree should be planted but a thrifty, well-rooted and carefully lifted individual, and that it should receive no check in transplanting, but continue in uninterrupted growth with every possible provision for, and assurance of, a long and vigorous life. Without such deliberate care every tree planted will be likely to prove a disappointment, which will grow more bitter as the years roll on. While, on the other hand, every tree which is planted as it should be, and which is full of joyous life from the outset, will prove an enduring and ever-increasing source of comfort and satisfaction.

In *Harper's Magazine* for September Mr. Hamilton Gibson's pen and pencil once more invite us out-of-doors to the wild gardens of Nature's own planting. Very beautiful are the pictures of Cypripediums, Lupins, Pyrolas and the rest, and very pleasant are the artist's sympathetic descriptions of these wildings and their ways.

But is it not possible for one to make room in his affections for the flowers of the garden as well as for the flowers of the wood-side and way-side? Mr. Gibson seems to doubt this, and he even stigmatizes as a "pagan marplot" the gardener who had succeeded, as many others have done, in flowering a hybrid Lady's Slipper of his own production.

Of course all hybrid Orchids are not more beautiful than their parents, and some are not beautiful at all. Of course such objects can never have the particular kind of charm which invests a bit of Nature's handiwork chanced upon out-doors. And, of course, a man who devotes himself to hybridizing Orchids or anything else may become so proud of his results as to lose sight of their relative

importance in the vast sum total of flowering plants. But, after all, we cannot have too many beautiful flowers, and many very beautiful ones, which we should not otherwise have had, have been given us by the hybridizer. Moreover, his labors have largely helped the botanist to read the riddles which attend the descent and affinities of wild plants; and, if this is so, it is simply because the hybridizer follows Nature's own lead. Nature herself is the great, persistent and inventive hybridizer, as any one may discover if he will try to study our Oaks, for example, our Willows, or Orchids themselves. If we do well to scorn the gardener who can see no interest in "the wild garden of innocence and peace," are we not equally open to criticism if we find no beauty in the infinitely varied products of the seed-bed and the propagating-house? Could Mr. Gibson have known without the hybridizer's telling which of the *Cypripediums* he saw were man's hybrids and which Nature's? And if not—or even if he could—why might not each challenge admiration on its intrinsic merits?

No doubt it is a degenerate taste which sees no charm in the modest flowers which open trustfully without any care of man, and writers like Mr. Gibson, who invite us to the nooks where they are hiding, are doing a worthy service. But an affectation of simplicity of taste may be as undesirable as other affectations. Cultivated flowers do not lack beauty; many of the flowers of artificially produced hybrids do not lack beauty even when growing in the "degenerate precincts" of the hybridizer's garden.

It is hardly a month ago since we called attention to the danger which threatened the last remaining grove of Giant Sequoias in Tulare County, California, and expressed the desire, which must have been shared by every public-spirited person in the country, that this forest should remain the property of the nation forever. The most that could have been reasonably hoped was that Secretary Noble would withhold this land from entry for a time until public opinion became sufficiently strong to make it possible to secure some protective legislation. But a bill to set apart this grove as a public park forever was at once introduced into the House by General Vandever, and it has already passed both Houses by unanimous consent. The reservation not only includes the particular township first named, but certain other outlying forest-lands, and especially some in which are the fountains of the streams which flow through the principal grove. By this act the park is placed under the exclusive control of the Secretary of the Interior, whose duty it shall be as soon as possible to make and publish rules for its care and management. It is enacted that these regulations shall provide for the preservation from injury of all timber, mineral deposits and natural curiosities within said park, that the reservation shall be maintained in its natural condition, and, also, that the fish and game within its boundaries shall be protected from capture or destruction for the purpose of merchandise or profit. Provision is made for the erection of such buildings as may be needed to accommodate visitors upon leases not exceeding ten years of parcels of ground not to exceed five acres.

The proper management of this reservation, however, is a matter of future concern. The cause for congratulation is that there is now no danger that this last remnant of the race of colossal trees shall be given over to destruction. And now, why should not a similar reservation of Redwood forest be made somewhere in the Coast Range? These trees are even more beautiful and almost as interesting as the Big Trees, their relatives. Redwood timber is of such well known value that it is rapidly falling before the axe. In a few years these beautiful forests will be only a memory. It may be that there is no typical Redwood forest still remaining in the hands of the Government. If so, the state of California or some of the wealthy citizens of that state could leave to posterity no more enduring monument of their public spirit than the gift of a

tract of Redwood timber with provision for its protection forever.

And have we not reason to hope that the Committees of Public Lands in both Houses, to whose efficient action the country is primarily indebted for the salvation of the Sequoia grove, may now be encouraged to report the Yosemite Park Bill? The success of the Tulare Reservation Act would seem to indicate that the sentiment of Congress in reference to matters of this sort is now altogether wholesome. The Yosemite bill can be passed at this session if the effort is only made with courage and confidence.

Plan for a Small Town Place.

IN GARDEN AND FOREST for May 28th, 1890, we published outline plans of four small places, showing the importance of a skillful disposition of the house and other buildings, with reference to special local circumstances. We present this week one of these same plans on a larger scale with the intention of showing the design a little more fully.

The place is not a new one, for the house, which is an old-fashioned, square, colonial brick structure, was built about fifty years ago, and the garden was laid out and planted at the same time. It had been long neglected and trees allowed to grow up and crowd each other so much that many were ruined, and they were so spread over the ground as to destroy all breadth. A few years ago, while alterations and additions were being made to the house, it was thought best to rearrange the garden at the same time, and, of course, the first thing to do was to thin out the trees and save the best of them, leaving in general a belt about the borders of the property to screen out neighboring buildings.

A low, broad terrace was thrown out on the east side of the house, lending dignity and support to it, and a wall was carried from the house to the street on the south, which completely enclosed the garden and made it retired, domestic and secluded.

As the house was distinctly a winter residence, this seclusion and protection of the garden was considered the more important, and for the same reason there were planted on each side of the circuit walk and about the borders of the property groups and masses of broad-leaved evergreen shrubs, mostly *Rhododendrons*, but also such plants as *Andromedas*, *Kalmias*, *Mahonias*, *Daphne*, *Ledum*, etc., to get variety and to gracefully edge down the masses.

It will be noticed that the house has two entrances: one from the street on the south, and the other from the paved court-yard on the north. This court serves also as an entrance to the stables and to the kitchens, which are in the "L" of the house, but so arranged as not to be obtrusive or disagreeable from the court.

The place is about two acres in extent, and is situated on flat, high ground in one of the larger cities of New England.

Color Notes on California Wild Flowers.—II.

ONE of the prettiest of the California wild flowers in June and July is the Chilian Canchalagua (*Erythraea venusta*). It is abundant in southern California on the mesas and hill-sides, and in the valleys, usually less than a foot in height, but in some moist localities exceeding two feet. The rotate corolla, with a slender tube and five (rarely four or six) divisions, exceeds an inch across, the divisions brilliantly colored, of a shade belonging somewhere between solferino and magenta, too dark for rose-purple, with a narrow white circle in the centre. The centre and the tube of the corolla, together with the rather prominent stigma, are of a greenish sulphur-yellow, the style and filaments white, while the prominent, exerted, erect anthers are of a brilliant lemon-yellow. The blossoms close their eyes upon the going down of the sun, turning their bright, dewy faces to him again in the morning. The flowers will remain bright and fresh for days and weeks after they are gathered without being put in water. This is one of its most excellent features, the value of which will be recognized by florists. Sometimes, though rarely, the divisions of the corolla are of a delicate pale lavender and often pure white in this species. The white ones are especially lovely when seen in a mass of the brilliant solferino. It will doubtless prove easy of cultivation, and if so, the California Centaury will become deservedly popular in American gardens. Medicinally the plant possesses valuable antiseptic and febrifuge properties, and is in high repute as a bitter tonic and stomachic.

Agave Desertii, one of the Mescal or Maguey plants, so abundant on the western borders of the Colorado Desert, produces

a stalk about seven to ten feet in height, surmounted with a large panicle of flowers of a chrome-yellow. The foliage is of a glaucous green.

Krameria canescens, also a denizen of the Desert wilds, is a low shrub about two feet high, bearing in spring-time a profusion of showy magenta colored flowers.

Læselia tenuifolia is a showy plant, of a span to a foot in height, which produces an abundance of flowers of a color somewhat difficult to describe—something between a poppy-red and a carmine, and very brilliant. This is related to the Phloxes and Gilias, and is equally worthy of cultivation as any of them. It is found abundant on the table-lands bordering the Colorado Desert on the west, in Lower California, and a few plants stray north of the boundary into this county. The altitude of its habitat is from four to six thousand feet. This herb is also credited with valuable medicinal properties, being held in high repute by the Indians and Mexicans, who use it in various diseases, especially in fevers.

In the mountains of Southern and Lower California there is a peculiarly beautiful form of *Calochortus luteus*, with flowers an inch and a half across of deep lemon-yellow, with a maroon-purple spot near the base of the petals. The glandular area is also of a maroon-purple, the space between being occupied with numerous lemon-yellow hairs. The scape is one to two feet in height. The plant is rare, growing very scattering in rocky places.

Mimulus brevipes has large, showy lemon-yellow flowers, and is one of our most abundant annuals.

Mimulus glutinosus is a shrub rarely more than two feet high, and produces in spring an immense mass of large buff-yellow flowers an inch and a half long, over an inch across, with two orange spots in the centre of the flower, the tube of the corolla white.

Dicentra chrysantha is a fine perennial plant, with delicate glaucous green, finely divided foliage, and producing a tall spike of flowers of a bright gamboge-yellow. It is not especially showy, but quite noticeable, and has long been in cultivation in Europe, where it is still in good demand. Like many others of our California wild flowers that have met with success in Europe, it still seems to remain unrecognized in eastern America.

Chanactis artemisæfolia is a rank growing, rather conspicuous and pretty annual with us, attaining a height of three or four feet, with wide-spreading branches, bearing numerous white composite flowers in balls an inch in diameter.

Sphæralcea Emoryi is a half-shrubby plant, one to five feet high, closely related to the Abutilons, with foliage of a sage-green, and showy, flame-scarlet flowers. It is easily cultivated and a very desirable plant.

Thamnosma montanum is a low shrub found on the mountains bounding the Colorado Desert on the west. It has a very pungent, spicy odor. The yellowish bark of the nearly leafless plant is prettily set off by the numerous prune-purple flowers, which fade to white.

Astragalus Purshii, var. (?) *coccineus*, Parry (West American Scientist, vi., 9-10), is one of the most beautiful and showy of the genus, producing a profusion of handsome scarlet flowers. It is confined to the same region as the last, and is probably the last plant to receive its name at the hands of the late Dr. C. C. Parry. It is scarcely a span high, the stems and foliage covered with a dense white tomentum, and forming a rather broad, compact mass, which wonderfully enlivens the rocky or sandy places where it grows with its large and showy flowers. It is the most worthy species of the genus in Southern California for extended cultivation.

Monardella lanceolata is a showy annual of our mountains, producing masses of bright Phlox-purple flowers. It is six inches to a foot high, branching, with a strong but pleasant Pennyroyal perfume, and is well worthy of cultivation.

Orcutt, California.

C. R. Orcutt.

A Suggestion from Nature.

OBSERVING planters can often find instructive hints as to the arrangement of trees and shrubs by studying the ways in which they naturally group themselves in certain soils and exposures. Before our camp to-day lies a small island, which may be taken as the type of very many similar ones in the "park region" of Minnesota, and any landscape-gardener who has a little island to cover with foliage could gather some fresh ideas for his work by taking note how Nature has done hers.

The beach of the island is sand on clay. The interior rises some ten feet above the water and is gravelly. In the shallow water are Bullrushes; dense near the shore, and the shore itself is bordered with a circle of pale Willow-bushes. Inside

the Willows is a circle of Alders, a little taller; then a circle of Birches, with occasional dark spires of Fir; then Elms, with a central dome of Norway Pine.

Other islands of the type, but smaller, have circles of Spiræa, Willow and Maple, with a group of Elms or a single drooping Elm forming the dome. Some have a single White Pine in the centre; some a group of Firs or a White Spruce.

It should be borne in mind that Fir, Spruce and White Pine require damp subsoil, and in nature are brushy underneath, while the Norway Pine grows best on dry ground, and as soon as a roof is formed the lower branches drop off and a yellow carpet of the leaves is spread underneath.

Caribou Lake, Minn.

H. B. Ayres.

A New Enemy to Willows.

EARLY in the present year I called attention to the imported Elm-borer (*Zeuzera pyrina*), which is now known to extend from New York City to beyond Newark, as a danger to our Elm. The present season has brought into notice, as a danger to Willows, another imported insect, this time a beetle, known as *Cryptorhynchus Lapathi*. It is one of the snout beetles of which the white Pine weevil is a shining example, and the injury to Willow is in appearance much like the injury to Pine. The beetle is black in general color, about five-sixteenths of an inch long and nearly half as wide, with the ends of the wing-covers a rich pale pink, an oblique shoulder stripe of the same color and the thorax also with pinkish lines above. There are five tufts of elevated black scales on the thorax and a linear series on each wing-cover, which are quite prominent and readily identify the insect. Altogether it is rather a pretty species, the legs being also banded with pink. The beetle makes its appearance in June and July, and lays its eggs in the branches, and, sometimes, also the stems of young Willows, apparently very close together. The larvæ hatch the same fall, burrow into the wood until the branches are honeycombed in every direction and change to a pupa in May or June. Samples of infested branches shown me contain burrows as closely run as the wood will sustain, and in the neighborhood of Newark, I am informed, many Willow clumps have been entirely killed off.

The first notice of this species in America was by Mr. Wm. Jülich, of New York, who in 1887 published the appearance of the species near Hoboken, New Jersey, in Willows there, and mentioned that isolated specimens had been found previously in Hoboken and on Staten Island. Since that time it has been found more frequently, and in the summer of 1889 a single specimen was taken near Newark, where previously none had been found. Early in 1890 the Newark collectors noticed the dying Willows and bred numerous specimens of the beetle from infested branches. In Staten Island it has also increased and multiplied and bids fair to become a serious pest. In Europe the species is a Poplar feeder, and probably this tree will not be exempt here when the insect is thoroughly domesticated.

There is only one treatment possible for this pest, and that is cutting all infested branches and burning them to prevent the maturing of the beetles. The cutting should be done early in spring, when the infested branches are most easily recognizable, and the remedy should be thoroughly applied. A tree once attacked will be eventually killed if the beetles are allowed to breed freely or if the knife is not thoroughly used. It is a small measure of comfort to know that the insect has brought with it a parasite which may eventually succeed in obtaining control; but at all events we seem to have fairly domesticated with us another emigrant which may prove as serious a pest as the Elm-leaf beetle.

Rutgers College.

John B. Smith.

Buildings should not stand alone in open ground, lest they have the effect of spots, and appear foreign to the nature around them and not as if they grew in it. It is in the highest degree important that they should be in keeping with the landscape. Buildings within a park are only parts of a whole; and they must be designed with just as much regard to the view of them as to the view from them. A certain irregularity in park buildings is to be desired, as more conformable with nature and more picturesque. Buildings half hidden behind each other, large and small windows in the same wall, door-ways unsymmetrically placed, projecting and retreating angles, now and then a high bare wall with a rich cornice, isolated towers, widely overhanging roofs and balconies unsymmetrically set; in short, everywhere a striking but far from in-harmonious irregularity, which expresses imagination, while yet the motive for every departure from regularity either appears at once, or may be divined.—From *Pückler-Muskau's "Andeutungen über Landschafts-gärtnerei,"* 1834.

New or Little Known Plants.

A Curious Form of *Kalmia*.

THE monstrous form of Laurel (*Kalmia latifolia*), figured on page 453 of this issue, was discovered a few years ago by Miss M. Bryant in a large natural Laurel-thicket near Deerfield in Massachusetts. The attention of the public was called to it by Dr. Asa Gray, to whom Miss Bryant submitted specimens, and who published in the *American Naturalist* (iv, 373) an account of this freak of nature in a note entitled "Dialysis with Staminody in *Kalmia latifolia*."

The monstrosity consists in the division of the ordinarily five-lobed, saucer-shaped corolla into five narrowly linear or sometimes nearly thread-shaped petals alternate with the calyx-lobes. They are ovate at the base and by the revolution of the margins become sometimes almost thread-shaped above and so resemble filaments, the resemblance being increased by the fact that these petals are occasionally tipped by a single abortive anther. The plant, therefore, serves as a capital illustration of one form of dialysis and possesses considerable interest to morphologists. The pouches on the inner surface of the corolla peculiar to *Kalmia*, which receive the anthers before the flower-bud expands and hold them back, until freed by insects visiting the flower, thus insuring cross-fertilization, are rudimentary in this abnormal variety and are represented by a slight depression on the inner surface and a corresponding boss on the outer surface of the petals. The stamens are normal except that they are erect or at length somewhat recurved with anthers entirely free. The pistil is normal and the plants produce seed freely in cultivation.

One of the two or three plants discovered by Miss Bryant was introduced into the Arnold Arboretum, where it flowers regularly every year and produced the specimen from which Mr. Faxon has made the drawing which re-appears in our illustration.

The casual observer seeing the plant in flower would never guess that it was a *Kalmia*. The flower certainly is not as beautiful as that of the normal *Kalmia*, one of the most beautiful of all flowering plants. They are very attractive, however, both before and after expansion. This plant, which flowers very freely, is well worth cultivation, therefore, not only as a curiosity, but as an ornament to the garden. It can be propagated by grafting on the normal form of the *Kalmia*.
C. S. S.

Foreign Correspondence.

London Letter.

PROTECTION FOR THE ORIGINATORS OF NEW PLANTS.—This was the subject of discussion in *The Garden* and other London papers two years ago. Mr. T. Francis Rivers, whose fame as a raiser of new fruits of sterling worth is world wide, started the discussion by stating a very strong case in favor of protection, and suggested that a reasonable time should be allowed for the raiser to keep a right of property in his invention. When Mr. Rivers complains that seedling fruits raised by him and recognized as being worth planting for industrial purposes have yielded only a very unsatisfactory return, we are bound in fairness to ask if this kind of thing cannot be remedied. Difficulties of a serious kind were pointed out in the discussion which followed Mr. Rivers' letter, and these are emphasized in the leader in *GARDEN AND FOREST* for July 30th. The weight of opinion is, on the whole, against protection. Abuses which would prove probably far more intolerable than unfairness to the raisers of new plants would be the inevitable result of any attempt to protect the latter. In the case of new plants introduced from some other country, protection would rarely be of much avail, unless the introduction of the same plant by any one except the holder of the copyright were forbidden. The temptation to use the name of a valuable new plant for a counterfeit would, as you suggest, be strong, but on the theory that the Rose by any other name would smell as sweet, a copyright plant with a non-copyright name would soon find a market if deserving of it.

After all, the give and take principle must be fairly satisfac-

tory to dealers in new plants. If Mr. Rivers finds that his new Plums are a source of considerable profit to many who have speculated in them, he can, on his part, do likewise with the new Grapes or new Apples raised by somebody else. From the point of view of the consumer it must be an advantage to have, let us say, a thousand propagators scattered all over the world diligently working up as rapidly as possible a stock of a new and improved fruit or vegetable or flower rather than to be compelled to wait until the copyright had ceased. That the bulk of growers would wait rather than pay a high price is shown by what is done in the case of those articles where protection is afforded. That the nation, as a whole, is a gainer where there is no protection is a political belief which I think applies in this matter of plant distribution.

SCHUBERTIA GRANDIFLORA, so well figured in *GARDEN AND FOREST*, page 368, is a most useful summer-flowering climber, as it grows and blooms freely under the most ordinary treatment. In the stove it is trained along a rafter, which it completely hides with healthy green leaves and numerous clusters of ivory-white, Stephanotis-like flowers; in the same house it forms a good specimen plant when the shoots are trained over a balloon-shaped trellis. In addition to these uses we have it trained along the roof of a greenhouse, where it has flowered well all summer. Evidently this plant is as accommodating in its requirements as its near ally, *Physianthus albens*, which also may be used either in the greenhouse or stove. Cuttings of the *Schubertia* have not readily struck root here, but seeds have been ripened from which a stock of young plants have been raised. *Physianthus albens* also fruits freely here.

BEGONIA HAAGEANA is a most ornamental flowering plant for the stove. It grows to a height of about three feet, has large, handsome foliage, and produces all summer numerous broad, semi-drooping racemes of large pale flesh-colored flowers. It was introduced from Brazil by Messrs. Haage & Schmidt three years ago, and was figured in the *Botanical Magazine*, t. 7028, as *B. Scharffiana*. Several large specimens of it are now the most attractive of all the evergreen Begonias in the Kew collection.

IXORA MACROTHYRSA is this year again very fine at Kew. The heads of flowers are as massive as the largest heads of *Hydrangea hortensis*, and they remain fresh almost as long. Their color is a deep crimson.

PASSIFLORA KERMESINA (Raddiana) is a very effective climber in the stove; and it is as easy to cultivate as the commonest of Passion-flowers. For small houses it is particularly useful, as it requires only a square yard or so of space to make a good display of bloom. Trained loosely along a rafter so that the shoots may hang downward when clothed with its pretty carmine flowers it produces a pretty effect. The leaves are medium in size, three-lobed, and colored dark green above, deep claret below. The species is a native of Brazil, whence it was introduced into England sixty years ago. *P. Loudoni* is a cross between it and *P. racemosa* (princeps), and *P. Kewensis* between it and *P. cœrulea*.

CATTELEYA HARDYANA is perhaps the most gorgeous colored of all Cattleyas, as is indicated by its being supposed a wild hybrid from the very fine species *C. aurea* and *C. gigas*. It is imported with *C. gigas*, which it resembles exactly in pseudobulbs and foliage, so that a newly imported *C. gigas* may possibly prove on flowering the much coveted *C. Hardyana*. Recently this plant has attracted a good deal of attention. It appears to have one bad fault, namely, the liability to fall a prey to that mysterious disease which too often attacks and suddenly destroys *C. Dowiana*. Plants of *C. Hardyana* are sometimes shown at the meetings of the Royal Horticultural Society, where they are always much admired. There were several at the meeting held this week, and along with them a very similar Cattleya called *C. Massaiana*. This is said to be a natural hybrid from the same parents as *C. Hardyana*, and whatever their origin the two are certainly very much alike. The former has the sepals and petals colored a pale rosy salmon and a large lip fully three inches across, shaped as in *C. Dowiana*, its color being rich maroon-crimson in front, with a pair of broad patches of yellow and veins of the same color running into the throat. The plant worthily obtained a first-class Certificate. Plants of ordinary *C. Dowiana* have been sold for this beautiful Cattleya. Flowering at this time of the year these plants are particularly useful. I might mention that there is a tendency amongst Orchid fanciers to call all deep colored varieties of *C. gigas* forms of *C. Hardyana*. The former is a magnificent Orchid, but it lacks the beautiful gold penciling on the lip, so conspicuous a character in true *C. Hardyana*.

DAHLIAS.—There were some good flowers of these exhibited at the last meeting of the Royal Horticultural Society, chiefly

from the nursery of Messrs. J. Cheal & Sons, Sussex, whose collection of Dahlias is a choice one. The most striking of the new kinds was a Cactus variety called Mrs. J. Douglas, the flowers large, of the Juarezii type, the petals curled and colored salmon, tinged and shaded with purple. Although not bright in color, it is a new shade in show Dahlias. Among single-

cerise; Primrose, one of the prettiest of yellows. Besides the Cactus kind called Mrs. J. Douglas, I noted the following as first-rate in color and form: Beauty of Brentwood, rich purple; Yellow Juarezii, clear canary yellow; Cochineal, rich crimson, with Juarezii itself, which is still unbeaten as a bright crimson. Amongst Pompone varieties I selected: Admiration, crimson



Fig. 56.—*Kalmia latifolia*, var.—See page 452.

flowered kinds the best shown were: Gulielma, pure white, margined with buff-yellow, a very pretty flower; Victoria, white, with a deep crimson margin; W. C. Harvey, flowers large and colored rich yellow, with an orange shade; Brutus, a rich crimson; Duchess of Westminster, white and elegant as an Anemone; Mrs. Cleveland, a clear terra-cotta, shaded with

with white tips; Don Juan, rich maroon; Golden Gem, bright sulphur yellow, and Hector, scarlet. These small flowered varieties are useful for supplying cut-flowers for the house. To produce effect in borders or beds the colors ought to be bright and clear, the dull colors being much less telling.

London.

W. Watson.

Cultural Department.

Notes on Shrubs.

A LATE-FLOWERING LILAC.—On page 165 of the present volume of GARDEN AND FOREST there is given an illustration from a photograph of a cluster of the blossoms of *Syringa Pekinensis*. Although the production of a second or late crop of flowers is a circumstance not unusual among some kinds of shrubs, it seems worthy of note that a plant of this species is now (September 9th) blooming freely at the Arnold Arboretum. The plant is upright in habit and about fourteen feet in height. It bore no flowers in June, which is the regular blossoming season of other individuals of the species. There are from twenty-five to thirty large panicles of flowers on the plant, the largest clusters being about a foot in length. Unlike their usual habit, these panicles do not all open their flowers almost simultaneously, only a few panicles being in blossom at any one time. The earliest of these were showy in the last week of August, and with cool weather the latest will not fully develop their bloom until the last week of September at least. The panicles are borne at the tips of this season's shoots. Some of them, as before stated, are a foot in length, and they average quite as large and fine, and are as fragrant, as any produced in the usual flowering season. Usually the second or late blooming of a plant is much inferior to the first. At a distance the great panicles of flowers of this *Syringa* might be mistaken for those of *Hydrangea paniculata grandiflora*, which is just now in its best condition. It seems too much to expect that the late flowering of this specimen of *S. Pekinensis* will prove to be a constant habit; but if it proved so it would be worth perpetuating, and would be a valuable acquisition among the late white-flowered shrubs which attain large size. Other plants of *S. Pekinensis* which flowered at the regular season, in the latter part of June, are producing an abundance of fruit.

BERCHEMIA RACEMOSA, a Chinese and Japanese plant, belonging to the Buckthorn family, opens its earliest flowers here during the last days of August. The rather large compound panicles of small greenish white flowers are borne on the ends of the shoots or lateral branches, and, although noticeable against the general mass of dark green foliage, they are not very attractive or showy. In this climate the chief claim to ornamental value of this plant is in its clean, smooth, dark green foliage, which forms a good covering to the stems. The leaves are ovate, usually somewhat pointed, and are from one to two inches long. The blossoms are not even so large as those of the common Buckthorn. The fruit has not been produced here. It is oblong, about the size of small peas, and is said to be quite showy and ornamental. The late flowering habit would prevent the fruit from maturing here before the early autumn frosts occurred. This species has not so far proved as hardy as could be desired, although there are probably some situations in this latitude where it might attain a fine size and development; and where, when it became old and well established, it would withstand the vicissitudes of our climate. It is a trailing or twining shrub or vine, having apparently more of the habit of the Bittersweets (*Celastrus scandens* and the Japanese *C. punctatus*) than any others of the familiar shrubs or vines of our gardens.

Under favorable conditions the stems would probably climb high into trees or other supports, but here they only attain a length of ten or twelve feet at the most, although they are very free growing.

The American representative of this species, the Supple Jack (*B. volubilis*) of the southern states, is hardly so well able to endure our winters as *B. racemosa*.

Arnold Arboretum.

J. G. F.

Mulching.

THERE is really no tree or plant which is not benefited by mulching. It is not improbable that we shall yet come to a system of agriculture in which mulch will be used for Corn and Potatoes and garden vegetables. Experiments in that line have proved beneficial. The only question is, Will the expense and trouble be compensated by sufficiently larger crops? Taking into consideration the liability to droughts there is little doubt but we can devise methods of mulching that will pay. What we need now is statistics of losses and waste of our fairly estimated crops. We must then consider how much of this is preventable. I believe that the loss and waste of the fruit crop is at least one-half, and of the Corn and root crop one-fourth of the average. The fluctuation of prices is not the chief difficulty with the farmer; the point to aim at is securing

full remuneration for work and expense by getting invariable harvestings.

But mulching has an application of very great importance in the planting of trees. No tree, under any circumstances, should be set without a foot covering at once. It is the one most important point in planting, more so than large holes and carefully set roots well pounded down. Pruning has less to do with the life and growth of the tree. I reckon that a Pear-tree well mulched gains three years over one that is not. Chip refuse, coal ashes, wood ashes mixed with waste, long manure, cut straw, old or waste hay, are all good material. Whoever has evergreens or an evergreen-hedge to set will find three-fourths of his success dependent on mulching, the other fourth on not letting the roots see the sun or get dried for one moment. I moved a hedge of twenty years' growth six years ago and did not lose one plant. It was well done in all respects, but I relied mainly on puddling and mulching.

We have yet to learn the value of mulch in the handling of flowers. Setting out bedding plants involves a loss and a set-back; but if mulched with a handful or two of coarse compost the loss is reduced to a minimum. In the western states gardening and orcharding require more attention to root protection than in the Atlantic states; but it is important even in the most moist sections. The secret of success with trees and shrubs is persistent mulching.

Clinton, N. Y.

E. P. Powell.

Hollyhocks.

IN British gardens of all sorts and sizes the Hollyhock is a favorite plant, and its admirers and growers are by no means few. Taking it for granted that the same may be said of the Hollyhock in America, the following remarks, culled chiefly from a lecture recently delivered before the Royal Horticultural Society in London by Mr. James Douglas, may be of interest, and even of value, to American growers.

The Hollyhock, botanically known as *Althæa rosea*, is a very old inhabitant of English gardens, single and double varieties of it having been recorded as far back as the year 1597. Its introduction, however, according to Dr. Masters, was probably much earlier than this, and it is possible that it first appeared in the time of the Crusaders, who brought it from Asia Minor and the Levant. Gerard, who was born in 1545, mentions single white, red and purple varieties, and also double purple and scarlet forms, as growing in his garden; and Parkinson, who flourished a quarter of a century later, enumerates a much larger number of varieties, thus showing that the work of raising seedlings had been carried on to a great extent in the meantime. Since this period much progress had been made, and numerous varieties created, and a most remarkable thing was that many of the additions were owing to cottagers who had to work at their particular businesses from six in the morning till the same hour, and often even later, at night, but who, nevertheless, found time to look after their Hollyhocks and grow them to such perfection as to almost make a professional gardener envy their success.

The propagation of the Hollyhock is most easily accomplished by sowing the seed in the open border about May. When the plants are large enough to be easily handled they may be pricked out in the place where it is intended to flower them, in rows, about three feet apart, and four feet between each row. There are, however, other methods of propagating the Hollyhock, and one is by cutting off a leaf adhering to a portion of the stem, and containing an "eye" in the axil, and thus making cuttings, which will readily strike in a hot-bed. Another means is taking the shoots from the base, while root-grafting is also adopted to propagate the plants, a shoot being cut so as to fit into a corresponding cut in the root, and then securely tied round with matting.

The soil for Hollyhocks should be prepared early in autumn for the next year's crop, and should be made deep and rich. When the plants are placed in positions in spring they should be staked at once, so as to avoid disturbing them at a later period. When well established little attention is necessary, but if the best results are desired the plants should be regularly syringed with clean water. Directly any flowers begin to decay the petals should be at once removed, as, if allowed to remain and become mildewed, the seed-pods are apt to become affected and rot. The flowering and seeding period having come to a finish, the stems may be cut down to within six inches of the ground, after which the stocks may be dug up and plunged in a somewhat dry material, such as cocoanut fibre, there to rest for the winter. In the spring, all the shoots, except one, which spring from the old stock may be taken off for cuttings, and will soon strike in a hot-bed or frame.

As to the enemies of the Hollyhock the only insect which does much damage is red spider. An experienced gardener at once recognizes the presence of this pest by the leaves assuming a yellowish appearance. The best way to combat it is by washing the leaves thoroughly with a weak solution of soft soap. The Fungus known as *Puccinia Malvacearum* is a tiresome disease which attacks the Hollyhock at all stages of its growth. Mr. Douglas, however, found that when he left his plants standing out for two successive winters they were quite free from this fungoid disease, whereas afterward,

only, which he thinks is far superior to such abominable mixtures as soot, soap and sulphur. Mr. Smith, a large grower of Hollyhocks, never grows his plants under any circumstances beneath glass, believing it to be a forerunner of the Fungus disease. His seeds are sown in the open air, and his cuttings are put into open borders, which, however, have a southern aspect. Should disease make its appearance at any time, and, indeed, to prevent its appearance at all, a mixture composed of one peck of soot, two pounds soft soap and one pound of flour of sulphur is used. The mixture is made in a

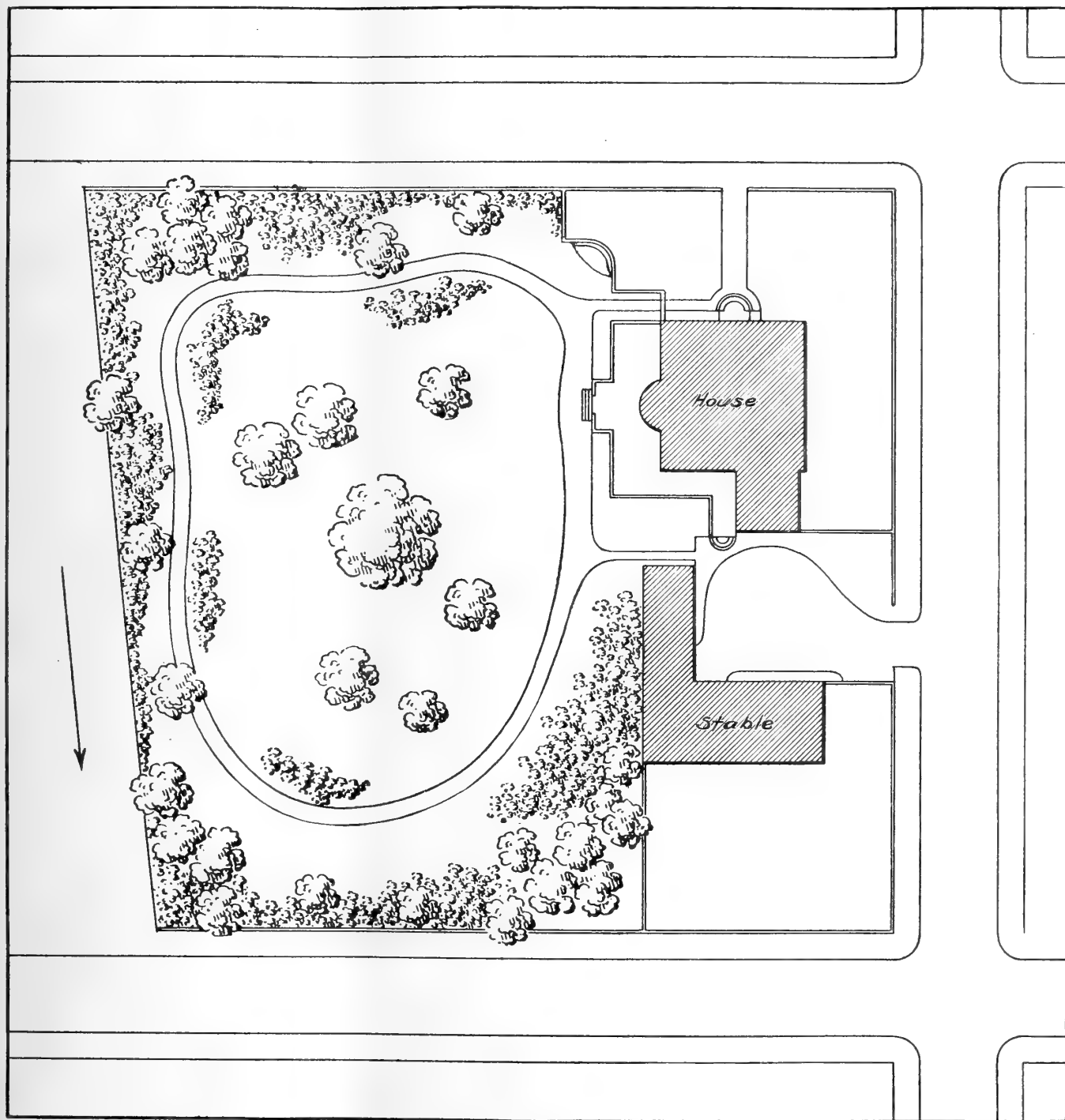


Fig. 57.—Plan for a Small Town Place.—See page 450.

when placed in a cold frame for the winter, the disease attacked the young shoots again in the following spring. It was combatted by taking off the affected leaves and painting the remainder with a solution of soft soap and sulphur. The inference to be drawn from this experiment is that if the plants are grown out-of-doors entirely they are free from the attacks of *Puccinia*. Recently Condry's fluid has been said to be one of the best destroyers of the disease, which it completely withers without in the least injuring the leaves of the Hollyhock, and Dr. Masters has great faith in sulphate of copper

zinc pail with hot, but not boiling, water, and thoroughly well stirred. It is afterward strained through a canvas screen so as to enable it to be readily taken up by the syringe. Every day as soon as the buds begin to appear the plants are well syringed with the solution until the flowers open, and no sign of disease or thrips ever appears. Another disease hitherto not mentioned is known as the "white mildew." This appears during hot summers, attacking the stems, and in a few hours causing the leaves to droop and the flowers to become flabby. The only remedy for this white mildew is to cut off the stem

and burn it at once, otherwise the disease is liable to extend rapidly to other plants.

It is the same with Hollyhocks, however, as with other classes of plants—some can grow them with little trouble, while others, with the greatest care, cannot succeed so well as many cottagers. This was the experience of Mr. Cannell, of Swanley, who always found the disease get the best of him when he used to grow a quarter of an acre of Hollyhocks. He had tried all sorts of remedies, but failed.

London.

Phono.

Sarracenias.

THE native Pitcher Plants, or "Side-saddle Flowers," as they are sometimes termed, are among the most interesting of bog-plants, and, when well treated, their curious foliage and quaint flowers give a pleasing variety in the arrangement of a cool house or conservatory. In general, they are not specially difficult to manage when under cultivation, the northern species, *Sarracenia purpurea*, of course, being perfectly hardy, while the various species belonging to the southern states will flourish in a temperature of about fifty degrees. The soil best suited to their needs is a mixture similar in character to that in which they are found in a wild state, this being usually composed of peat and living sphagnum, though under cultivation it is advisable that a liberal quantity of drainage material be placed in the pots or pans in which the plants are grown. In further imitation of nature a covering of live sphagnum may be placed on the surface of the soil, as this is not only an addition to the appearance, but also of benefit to the plants. An abundance of water during the growing season is, of course, necessary for the Sarracenias, and while as much is not needed during the winter, yet they should never be allowed to become actually dry. Some shade should be given all through the summer, and also free ventilation, for when kept too close and warm these plants are subject to the attacks of thrips, by which the foliage is soon disfigured. Enough variety can be found among the types to form the nucleus of a most interesting collection, to which may afterward be added some of the many fine hybrids obtained during late years.

Among the best of the typical species may be classed *S. flava*, one of the strongest growers, and producing its erect, funnel-shaped leaves or pitchers in profusion, some of the latter attaining a height of fully three feet. The pitchers of *S. flava* are bright green in color, while the flowers are light yellow or yellowish green, as the flowers differ somewhat in shade on different specimens.

S. Drummondii is another fine species of strong growth. A good specimen throws up its leaves to a height of three feet. These are also bright green in ground color, with the addition that the veining of the upper part of the pitchers is marked out in crimson, and the flowers are also dark crimson. This makes the plant entirely distinct from *S. flava*.

S. Drummondii alba is a most effective variety of the preceding, and is similar to the type in general characteristics, but distinguished from it in having the upper portion of the pitchers beautifully variegated with white. This is, doubtless, the best of the native varieties, and makes a fine specimen for exhibition purposes.

S. rubra is also a pretty species, though not quite as strong a grower as the sorts already noted. The pitchers are somewhat smaller and more slender in form, and they are veined and their upper portion frequently flushed with dull red. The flowers are quite dark in color and pleasantly scented.

S. variolaris is an odd-looking species, and has erect, hooded pitchers, winged in front and more or less marked with white. This plant bears a closer resemblance to the Californian representative of the Sarracenia family (*Darlingtonia Californica*) than any other species with which I am familiar, but it differs from the latter in having the true Sarracenia flower.

S. psittacina has some points in common with *S. variolaris*, chiefly in the shape of the pitcher, but *S. psittacina*, being prostrate in habit and much smaller in all its parts, is thus made abundantly distinct from it. To render it effective, *S. psittacina* should be massed in a large pan, and, for that matter, this is the most satisfactory way to grow any of the species, and with a little care they will make worthy ornaments for any conservatory.

The hardy pitcher plant, *S. purpurea*, may also be grown as a greenhouse plant, but under such conditions it seldom attains the rich reddish purple tint that is so admirable in the plant when growing in its native swamp, and it is, therefore, best that this species should be reserved for a snug corner in the bog-garden.

Holmesburg, Pa.

W. H. Taplin.

Notes on American Plants.

ONE of the most interesting plants at this season of the year, on account of its fruit, is the White Baneberry (*Actæa alba*). The oblong racemes of white flowers, which come about the middle or last of May, are quite pretty, but at that season are not so valuable because so many other plants are in flower. But now its large, shiny, white berries, tipped with black, take the place of the flowers, and remain prominent a long time. It has the advantage of many other plants of this sort, for there is nothing to take its fruit. Birds never seem to eat the berries, and they are not inclined to drop off as soon as mature, as many others do. Its height varies from one to three feet, and it is not rare to see plants well fruited that are scarcely ten inches high. It likes the shade, a rich and well drained soil, and may be transplanted in either spring or autumn.

Zephyranthes candida, a fine representative of the Amaryllis family, was sent us from southern Texas. It comes from a medium-sized spherical bulb, which is covered with a thin coating not very unlike that of an onion. It seems to be a strong, healthy species, with numerous grass-like leaves a third of an inch or more in width. The large white flowers come later in the season than most of its class, which makes it the more valuable. They are nearly two inches wide and single at the summit of the almost naked scape. It is useful for cutting, though the stalks are not so long as those of the Cooperias. We have not tested its hardiness, but I suppose it would not stand much frost, and it is not necessary that it should, for these bulbs from southern Texas and Mexico winter very nicely in the cellar and are among the easiest of tender plants to manage.

Gentiana linearis, which was formerly known as *G. saponaria*, var. *linearis*, has a closed flower, usually over an inch long, of a light blue color. Its leaves are long and narrow, and the numerous simple stalks are from one to two feet high. Near the summit of the stronger ones are borne two to four light blue flowers. It blooms considerably earlier in the season than the common closed Gentian (*G. Andrewsii*), and its habitat is confined, I think, to peat bogs in partly shaded situations. Transplanted into light loamy soil in the shade it does finely, especially after it becomes established. It may not always flower the first year after transplanting, but if it is in a suitable location it will the second year, and will continue to thrive for a long time thereafter. It may be transplanted in spring or early autumn.

The common closed Gentian (*G. Andrewsii*) is already in many collections of our native wild flowers. It is a valuable hardy perennial, not difficult to manage, and does fairly well in either sun or shade, though shade seems to suit it best. A moist loamy or gravelly soil seems to suit. It may not always live, but there is seldom any trouble in its management. It is a more leafy and stocky plant than the former, of about the same height, but with shorter and wider leaves, and shorter and thicker, somewhat darker blue flowers. It likes a moist soil, but not too wet. It transplants well in either spring or autumn.

Aster acuminatus is a species which grows in cool mountain woods. Most plants of this species are not very showy, but in some favorable locations they bear an abundance of large light purplish flowers in wide, flat heads, and are very handsome. This Aster is usually only a foot or fifteen inches high, and in some of the finest specimens the flat heads or corymbs of flowers are nearly six inches wide. It soon forms dense beds, and if the soil is very rich and moist it may become almost a pest. It needs more time to become established than most species, and a partly shaded location is better than a sunny one.

Southwick, Mass.

F. H. Horsford.

Dendrobium Findlayanum.—This is a very fine species and one easy to manage. The flowers, which, if spread out, would measure from three to four inches across from tip to tip of the petals, are produced from the upper portion of the stems, either singly or in pairs, on pale pink pedicels. The usual time for their appearance is about March and April, but it frequently happens that plants of *D. Findlayanum* will be found blooming as late in the season as July and August. The sepals and petals are pure white, with a purple stain at the tips; the former are oblong-lanceolate, and the latter oblong-elliptic, much broader and having a wavy margin. Comparatively speaking, the lip is large and roundish, the concave portion being deep orange-yellow, outside of which is a band of white decorated in front with a conspicuous stain of purple. To complete the description of the entire plant, the stems or pseudo-bulbs, which attain a height of twelve to eighteen inches, are remarkable for having each joint swollen into a pear-shaped or obovoid body, the attenuated base of which is

clasped by the sheath of an oblong-lanceolate acute leaf about three inches long and somewhat leathery in texture.

D. Findlayanum takes its name from a Mr. James Findlay who seems to have been the first European to discover it, about 1867, on the mountains dividing Burmah from Siam. Mr. Findlay called the attention of the veteran collector and botanist of Moulmein—Rev. C. Parish—to his find, and this gentleman in connection with Professor Reichenbach duly named and described it. It was not, however, until about ten years after its discovery that its first flowers appeared in England, this event taking place in the famous collection of Sir Trevor Lawrence, at Dorking.

The most convenient mode of growing this species is in baskets, which may be suspended from the roof within a foot or two of the glass, thus enabling the plants to receive abundance of light, which they enjoy. When the sun, however, is powerful the plants must be protected from its rays by means of shading. When the young growths begin to push forth, that is the time to begin increasing the supplies of water, and when they are approaching maturity the supplies may gradually be decreased, at the same time giving the plants as much air and light as is consistent with safety. The summer temperature may range from sixty-five to seventy-five degrees Fahr. during the day, and about sixty degrees at night, while for the winter these figures may be reduced by five or eight degrees.

Isleworth, London, W.

John Weathers.

The Egg-Plant Blight.—The Egg-plant has been seriously diseased during the present year, and the crop is light from the inroads of a blight. Complaints have come from various sources, but nowhere have the losses been greater than in some portions of Gloucester County, New Jersey, where this crop covers large areas, and where market-growers sometimes plant as many as fifteen acres. A microscopic examination of the diseased and drooping, half-developed plant reveals a Fungus in the pale yellow leaves which, after sending its fine threads all through the tissue, soon concentrates in small areas and produces brown spots, over which are developed minute dark specks. These specks bear the multitudes of minute, colorless spores or reproductive bodies that are capable of germination and producing the disease in healthy parts of the same or other plant. The fruit upon the sickly plants is small, and before reaching half the normal size the skin turns brown in patches, followed by a dark pimply development of the surface, which ultimately spreads over the whole fruit. Before this, however, the fruit usually falls to the ground, and shortly becomes a soft, spongy, rotten mass. These decayed fruits, when left in the field, become the origin of infection for other fruits; for each pimple—and there are thousands upon the same “egg”—is a spore-bearing body, as are the black specks above mentioned as occurring upon the brown patches of the leaves. This Egg-plant blight or rot is closely related to the black rot of the Grape, and the same differences between leaf and fruit-form are manifest. The species is *Phyllosticta hortorum*, Speg., and belongs to a large genus of destructive parasitic Fungi. In the laboratory it has been an easy matter to propagate the disease from one fruit to another, the infection showing itself in thirty-six hours. There is but little doubt that by spraying the vines with Bordeaux mixture or carbonate of copper in ammonia the trouble can be checked.

Rutgers College.

Byron D. Halsted.

Chrysanthemums.—It is about time to lift Chrysanthemums from the open ground. All plants should be dug around at least four days before removal, and a full week would be better. I use a sharp spade and thrust it in the ground around each plant in a circle, which about equals the circumference of the pot in which it is to be placed. The digging around cuts off the long roots, after which young fibres are formed within the circle, and they commence feeding at once. If the long roots are cut at the time of lifting the food supply is rudely checked, the plant wilts and often the buds are crippled. The disbudding of all plants should be proceeded with as soon as the buds are as large as Radish-seed. Do not shrink from thinning severely. On one growth of stem from the surface of the ground of a plant of *Gloriosum* I have to-day removed forty-seven buds, leaving seven. These will be reduced to five, or perhaps to three, before the time of blooming. The flowers will be not less than five inches in diameter, and will present nearly as much coloring as if the whole crop of buds had been left, but with this difference, that a few finely developed flowers will take the place of many puny ones. By the end of the month it will be necessary to have all Chry-

santhemums where they may be protected in case of a sharp frost, which almost invariably occurs here between the 27th of September and the 8th of October.

Pearl River, N. Y.

John Thorpe.

The Forest.

The General Condition of the North American Forests.—II.

THE visitor from Europe is particularly surprised at the extraordinarily long and numerous wooden structures which the railway train sets to vibrating in crossing the water-courses. In America the streams retain a freedom of movement of which they make full use; one year here, another there. From high mountains the bed of a stream looks like a broad white band of water and gravel banks, with green, wooded islands between.

Streams are a good indication of the state of cultivation of the surrounding country. Those which from year to year discharge their clear water into the sea, and through the year scarcely vary in their water-level, come from an undisturbed wood-land. Their banks are held fast by the roots of the trees in the region of the head-waters, and in the mountains the water gathers slowly from the woods. Such streams one sees now for the most part in uninhabited regions only; in the Island of Hokaido, in northern Japan, for example, I have found such.

Streams which during the rainy season or during the season of melting snow flow turbid, and during the rest of the time clear, showing in ordinary weather small variations in their water-level, rise in woodlands, and flow through arable land, part of the soil of whose roads and fields the rains wash into the streams. Of this kind are the streams of Germany and France.

Finally, streams which year by year flow with turbid water, or which, at least, through the rainy season rush through the cultivated plains to the sea with swollen floods, here carrying away soil, there heaping up gravel-banks, come from an up-country in which the forest is almost entirely wanting, or the deforesting is under full headway. Such streams one sees, for example, in Ceylon, where the English, with plantations of Tea, of Coffee and of Cinchona, have begun the destruction of the forests and the woodlands of the mountains. Such streams are numerous in Japan, Spain and northern Italy. There the streams are feared whenever it rains a few days longer than usual. The American streams approach this stage. In their unrestrained impetuosity they vie with each other in bringing ruin upon their bottom-lands, which, as a rule, contain the best soil. That a change must have taken place in a river is clear when during the rainy season it undermines its banks covered with trees that have stood for centuries, and finally sweeps them away in its floods. Instances of this are numerous in America, and speak plainly to every one who can and will see, more plainly than all the books upon the influence of the deforesting of the mountains and the plains upon the water-level of streams. The deforesting of the Adirondacks through fire and in useless attempts to take the mountains for agriculture, causes a perceptible change in the water-level of the Hudson, which during the dry season is fed with the moisture of the earth in the Adirondacks. Formerly Peekskill was a water station of the New York Central and Hudson River Railroad. This station had to be abandoned because during the dry season the salt water forces itself as high up the stream as Tivoli, and salt water is unsuitable for feeding locomotives.

Although the American engineer is familiar with the increasing variation in the level of the streams, one sees but few efforts to regulate their flow, which, indeed, would involve a mere waste of money, as long as the average level of high water is yearly becoming higher. Moreover, many look upon the deforesting of the mountains with indifference, because they believe that the forest, with its beneficent influence, can be replaced upon a magnificent plan. Their idea is to fill enormous reservoirs with water during the rainy season, and then to permit the contents to flow throughout the cultivated lands. But for the filling of such reservoirs a considerable surface of soil which may collect the rain is necessary. It is to be hoped that the rain will be so gracious as always to fall with due regard for human safety, for the breaking of the reservoirs might have worse consequences than a cloud-burst. To me it seems much safer that the great amount of money which permanent water-works would require should be utilized in buying up the mountain lands and preserving their forests. This would be good policy even without taking into account the fact that these natural reservoirs bring in money, while the artificial ones only swallow it up.

In spite of the outrageous management of the forest everywhere in the United States, I am inclined to believe that, partly of itself, partly with some little help, it will return to its beneficent condition, if in the future it should be possible to preserve it from fire. Danger of fire in the forests in the civilized part of Europe has become a rare thing; at the least fire every one hastens to put it out, and the Government has power to compel all to help.

In India the number of forest-fires is lessened yearly, thanks to the energetic measures of the Government and the watchfulness of an efficient body of foresters, while young growth springs up on the protected plains.

In Japan, a smaller country, fire and the axe have already nearly completed the work of destruction. The brave nation is laboring with the utmost zeal and with great outlay of money for the restoration of the forest on the shrub-covered mountain slopes, and for the preservation of what still remains.

In North America the practice of burning forests has become customary, even in cases in which it is entirely without reason. How can anything else be expected from the descendants of a nation that has no forest, and therefore knows nothing of the blessings of a forest? Closer study of the causes of the burning of the forests forms an instructive, if not an edifying chapter. We see what man can bring to pass in a country of such highly vaulted elbow-room, in a country where the most complete individual liberty seems to be the chief principle, in a country whose laws for forest-protection are empty threats, because the ignorant and unprincipled cannot be compelled to obey them.

According to the report of Professor Sargent, one million acres of forest were burned in a single year (1879-80), and with it twenty million dollars' worth of property was destroyed. The causes of these fires have been ascertained, as follows: 197 fires resulted from burning over pasture lands; in 1,152 cases fire started in making forest-clearings; 508 started from locomotive sparks; 628 from hunters' fires; 72 from camp-fires; 35 from pipes and cigars; 12 from prairie fires; 9 from charcoal-burning; 32 from lightning; 56 were kindled by Indians; 10 by lumbermen; 2 by tourists; 262 were kindled maliciously; in 2 cases fire is said to have been started by spontaneous combustion; 3 times wood-cutters and 3 times unknown carelessness set the fire. This makes a total of 2,983 cases.

Let us examine further the fires started maliciously and those caused by locomotives, hunters and campers-out, 1,470 in all. The injury that the railway does to the forest-interests is very serious. One who travels to-day in North America must grow accustomed to the charcoal heaps on both sides of the railway, if he would have any pleasure from the beauty of the landscape. From the railway the fire has encroached for countless miles upon the forest. Upon the oldest railways the danger of fire is reduced yearly by constant burning of the trees from the clearing on both sides of the road-bed. Upon such clearings it would be an easy thing to cut off the fire from the forest with a safety-ditch. It appears to me that there is no other expedient than to make a cleared belt along the tracks as soon as possible. At all events, this does more good than the spark-arresters which the law prescribes, since, in spite of all laws, the locomotives run without them.

A characteristic result of the boundless freedom of the individual at the cost of the people is presented in those cases in which hunters and tourists camping or traveling in the forest cause the fires. In the year 1880 they kindled 700. As far as my experience in western America extends, the sportsmen are careful to burn the under-brush, which in the primeval forest contains generations of future forest-trees, in order that they may be less hindered in their aim. In other regions the woods are fired in order that the game throughout particular districts may be driven together. Comment on this is quite unnecessary. Forest-thieves, too, start fires, especially in the Government forests, in order to obliterate the traces of their theft.

With reference to the Yellowstone Park, the possession and the pride of the whole nation, H. Winsor says in his "Guide for Tourists":

"It is to be deeply deplored that because of the carelessness of campers-out, many of them cultivated people, vast stretches of forest have been destroyed by fire. The fires have resulted from neglect of the simplest precautions as to camp-fires. In consequence of this it is not at all unusual to be obliged to ride in the park for miles and miles between black tree-stumps instead of in the refreshing shade of the green forest. This thoughtless destruction of the forest should be checked by severe punishment of the offenders."

It should be provided by law that any one who causes a fire

shall be held for the injury done, and the amount of damages should be equal to the value of the woodland destroyed. But the injury done to the forests by overthrowing confidence in the security of forest-property, by discouraging the investment of money in forest, by the destruction of the young growth, and by the effect upon the fertility of the soil would still remain without mitigation.—From "*The Forests of North America*," by Dr. Heinrich Mayr.

Correspondence.

Wayside Beauty.

To the Editor of GARDEN AND FOREST:

Sir.—The several articles upon "Country Roads" which have appeared in GARDEN AND FOREST we have chosen to receive as words of personal approval, so well has their sentiment chimed with the spirit which has been moving us to better and to beautify a short bit of road which leads us daily to the station on the one hand, and to the village, less than a mile away, on the other.

A very few years ago this road was at times so deep with mud that it would become nearly impassable, and farm wagons especially were compelled to make quite a long detour to reach the station from the turnpike or from the village. The neighborhood becoming more popular and more populous, and the demands for better roads increasing, the county officials were induced to take this particular piece of muddiness in hand. The grade was first improved by cutting, filling and ditching. There was then laid down a good bed of the rock most convenient to the locality and known even to the geologists as "nigger head." This is an extremely hard *gabro*, occurring mostly in nodular masses and very difficult to crush, but when once in place and tightened by the pressure of wheels it makes, by reason of its toughness, perhaps the best of road-metal. The neighbors now came to the front, and of their own means and motion they covered this rough stony bed with a layer of oyster shells of from four to six inches in thickness. These were rapidly ground up on and near the surface, the finer bits trickling through and forming a compact mass below. Last winter's observations showed us that to attain perfection, and to make a model of our hobby, we should have still further to raise the middle of our road-bed a few inches—this time instead of oyster-shells we determined to try crushed blue lime-stone, which we brought by rail from near Waynesborough, Pennsylvania, the railroad giving us special rates. Of this stone, broken to pieces the size of chestnuts, we made a last covering of about four inches in thickness. The road is now perfectly smooth and hard, and is nearly as white as when covered with the shells. This whiteness, to which some might object, is by no means glaring or disagreeable, as the road is mostly shaded. On the contrary, it is found to be very convenient by night in enabling one to keep the track.

In spite of repeated insinuations of untidiness, and, indeed, of outspoken demands for the use of the scythe and the axe, we have succeeded thus far in preserving vegetation quite undisturbed, with the exception of pruning some overhanging and interfering tree-limbs. On the ugly red slopes of a long cut, through which the road passes, and also on the face of a rather steep bluff, we planted a good lot of Chinese Honeysuckle. This has outdone expectation, and has given us the densest walls of green in place of the ugly scored banks which were continually washing down or sliding into the road-side gutter. The fragrance, too, of its flowers fills the air, as well as our senses, with its sweetness, and bees and humming-birds abound. The other trees and shrubs which border our lane are essentially our own—that is, are American—and occur in sufficient variety to give a caste to the seasons. The Spice-wood comes out with its small yellow flowers to insist that spring has really come, and warns us later by its red berries of the summer that's waning. Why is it, by the way, that this Benzoin, with its fine foliage and generally attractive habit, has not become more commonly domesticated? I have been pleased to see it named in GARDEN AND FOREST among other commonly neglected native shrubs as worthy of a place upon our lawns.

The Blackberry-bushes along our road-bank were this year simply charming. Owing to the mild winter their long reeds of last year were not killed back, but becoming covered with flower-shoots and bending gracefully away from the high banks, the effect was most unusually beautiful. Wild Grape-vines are smothering the life out of some decrepit Locust-trees, and are competing hard with Honeysuckle and Poison Ivy for every bit of space and light. Wild Cherry, Viburnum and Dogwood contribute their part in flowers and shade, each in its time, and a number of Sassafras-trees save themselves

for the dying year, when they flare out with their splendid foliage of crimson and orange. Charlock and Hedge Mustard have established themselves over certain areas, and are very brilliant when massed in flower; but the gardeners pass them with an evil eye askance, and sometimes come back with a scythe or hoe. Just now the Compositæ are beginning to have their day. The Bonesets, Sunflowers, Asters and Golden Rods are conspicuous. At one point the road is hedged in by a dense mass of the pretty Jewell-weed in full flower, and all mixed and matted by a rank growth of Bunch-weed, whose little clusters of white-winged flowers mingle becomingly with the yellow, dangling nectaries of the Balsamine. Such are the more noticeable details of vegetation which we have succeeded in letting alone, and which make of this oft-traveled road, for some of us, a never-ending source of pleasure and interest. Should we hope for as much of a well kept, tidy road-side? We are encouraged to believe that others are beginning to take the view of these weeds that we ourselves take, and still others, alas! are so indifferent as not even to wish to destroy. This at least gives us hope of saving our wild bank as Nature makes it for us.

Baltimore County, Md.

B. W. Barton.

Shrubs on Tree Borders.

To the Editor of GARDEN AND FOREST:

Sir.—The short extract from Gilpin's "Practical Hints," in GARDEN AND FOREST of September 3d, page 426, touches a subject of vital importance in the development of landscape effect, which very few people appreciate as it deserves. The opening sentence gives the keynote of what I refer to: "Groups of large trees should be accompanied by shrubs to connect them with the lawn."

Any one who will look across a meadow or lawn at a line of wood the outer edge of which still retains its fringe of wild shrubbery presenting a mass of foliage impervious to sight from the ground upward, and will then contrast it with the more common case, in which all the shrubbery and low-growing limbs have been cleared, and the eye penetrates perhaps the whole breadth of the wood through a maze of bare trunks, will appreciate the superior beauty of the former. And yet, nine times out of ten, the first work of "improvement" on a new place is to set a gang of laborers to work at grubbing out all the wild shrubbery, and they always begin at the outer edge, where every leaf should be sacred.

I have grown tired of hearing the announcement from proprietors who seek my aid in developing the beauty of their grounds that they "have had all the underbrush grubbed out, so you'll have no difficulty in seeing through anywhere."

Many men, who have a genuine love of natural beauty, fail to appreciate this till their attention is called to it, when they acknowledge with surprise that they had never before analyzed the nature of the obviously superior beauty of a mass of foliage as compared with an open wood when seen across a lawn.

Minneapolis.

H. W. S. Cleveland.

Recent Publications.

Report of the Division of Forestry for 1889. By B. E. Fernow.

It may be that there is an author's edition of the Report of the Chief of the Forestry Division for last year, but we have not seen one. It will be found, however, in the general report of the Secretary of Agriculture, and although it is not so long as usual, it contains much important matter, which should be read by every person in the country who has the interests of our forests at heart. If the Forestry Division should ever become an executive department, charged with the management of the forest-lands which belong to the nation, its duties in that direction would be clear. If, on the other hand, it is to be simply a bureau of information there is a question as to what particular kind of information it should acquire and disseminate. With the present appropriation the Department is unable to command the services of competent assistants, and, of course, such systematic work as was outlined in the report two years ago cannot be undertaken. In the absence of adequate facilities the work done by the Department has been in a certain measure desultory, although the investigation concerning the prospects of substituting metal ties for wooden ones on railroads is considered by Mr. Fernow to be highly satisfactory. The biological studies in regard to timber trees have been carried on, although slow progress has been made for lack of means. Mr. Roth, of Ann Arbor, has furnished a comparative study of the woods of three prominent southern Pines, and these will be printed, together with the monographs

on the life-history of those trees. The monographs now on hand, and still unpublished, comprise the following species: The White Pine, by Professor S. V. Spalding; the Norway and Pitch Pines, by Professor William Flint; the Hemlock, by Professor A. N. Prentiss; the two Spruces (*Picea nigra* and *P. alba*), by Miss Kate Furbish; the Long-leaf, Short-leaf, Loblolly and Cuban Pines, by Dr. Charles Mohr. It is to be hoped that the publication of these studies will not be delayed, as they probably constitute the most valuable work which has been accomplished by the Division during the last three years. They are to be illustrated by wood-cuts of the highest order. Among the other work attempted during this year is a canvass among the railroad managers relating to supplies and prices of wooden ties; a canvass as to the needs of the cooperage industry, which uses two hundred and fifty million cubic feet of wood per annum, and the beginning of an investigation of the supply of timber needed for carriage-building; but the completion of the last inquiry has been deferred on account of lack of funds. Considerable labor was given to preparing an exhibit for the Paris Exposition and making forestry collections for the National Museum.

Mr. Fernow again points out the perplexities he experiences in distributing according to law "valuable economic tree-seeds and plants." Of course, tree-seeds, as a rule, do not permit of long storage, and must be carefully handled and rapidly disposed of, or they will lose their power of germination. Few people know how to handle the seeds except the kinds most easily grown, while the length of time before a plantlet will grow to a size fit for transplanting wearies the settler's patience. As might be expected, the reports from the seeds and seedling distribution of former years have been most discouraging.

A compilation which attempts to show the status of the forest-timber culture entries from the reports of the Land Office proves that the results are far from satisfactory. It may be that greater success will be gained from the entries of latter years, because of increased experience and because the timber-claim planting is now often done by contract by persons who make a business of it. Yet the consensus of unbiased testimony goes to show that this planting, as a rule, does not produce the results desired and has chiefly been used as a means of speculation in Government lands, either with this design from the outset or as a necessity after a failure to obtain land by timber-planting. Of course, there is some planting of wind-breaks and groves done on homesteads which have succeeded better, but the amount of tree-planting is infinitesimal, when compared with what is necessary to ameliorate the climate, and it may as well be admitted that the reforestation of the plains must be a matter of co-operative enterprise if it is not a national work.

Under the head of "Proposed Work," Mr. Fernow gives a condensed statement of what he thinks the character of the information should be and how it should be obtained if the Department is to continue simply as a bureau of information. In the first place, the Government needs information as a basis for action relating to its own timber-lands, and to enable it and the general public to appreciate the true relation of the forest-interests of the nation to its economical life. Again, consumers of forest-products need information which will help them to use the same economically and advantageously, and finally, the owners of natural woodlands need to know the best method of managing them for reproduction, and forest-planters need to know how to start and cultivate a timber crop. Government action can have no rational basis except carefully obtained and digested statistics, and statistics of forestry matters are among the most difficult to collect, and yet their collection is all the more desirable because of the difficulty of estimating and comparing present supplies and future requirements. But with the present organization of the division no comprehensive collection of accurate figures can be contemplated, however desirable and urgent such a work may be. Outside of these statistical inquiries there is a wide field for the study of our timber trees in the biological and technical direction. We are by no means certain as to the qualities of our timber trees and their adaptability to forest-uses, and still less do we know upon what conditions of soil and climate these qualities depend. Not only is the engineer and architect interested on this point, but the planter is as well; for he may be led to use a species which, while it may grow well in his locality, does not in the end develop those qualities for which it is most highly prized. We know very little, too, about the life history of timber trees, and this knowledge is the only basis of successful forestry. We have learned much about various trees in the nursery and their requirements for ornamental planting, but the behavior of these trees in the forest

differs greatly from their habit in the open ground, and as forestry means tree-culture for profit, it is essential that the relative growth of forest-species at different ages throughout their entire life shall be known, and at what age the most desirable quality and profitable size is reached. As an instance of the practical value of such knowledge Mr. Fernow calls attention to many plantations of Black Walnuts in the western states, which grew rapidly for ten or fifteen years, and have become since then a disappointment by their slow growth.

In order to settle many vexed questions in forest-culture and to obtain positive evidence as to the best method of planting, and the best timbers to use in arid regions, it is desirable to begin systematic experimental plantations. The co-operation of experiment stations now existing in treeless regions, as well as of private individuals who have special facilities, is therefore invited to establish such experiment plantations upon a uniform and centrally directed plan, and it is further suggested that the authorities in charge of the military reservations of the west be requested to aid in carrying out this plan.

To the report proper is added an interesting appendix on "The Influence of Forests on Water Supplies." We have no space for quotation here, but what has been discovered by careful investigation in other countries is very tersely set forth, and it hardly needs to be added that these figures do not confirm Major Powell's theories as to the destructive effects of mountain forests upon the flow of streams which take their rise among them.

Notes.

We have received the first number of the *Western Garden*, a new monthly journal of horticulture published at Des Moines, Iowa.

A meeting of the New Jersey Horticultural Society will be held at the College building in New Brunswick on Monday, September 22d, beginning at ten o'clock. This is the fifteenth anniversary of the organization of this Society, and it is especially requested that all those who were present at the beginning, as well as those who have since been identified with the Society, should make an effort to be present on that occasion. The exercises will be interesting and an attractive exhibition is promised.

Although the double site selected for the Chicago Fair was contrary to the advice given by Mr. Frederick Law Olmsted, it is to be hoped that he will accept the position of Landscape Architect which was offered to him. So far as spectacular effect is concerned, it was folly, of course, to divide the ground, but a satisfactory plan can no doubt be arranged. As usual in such cases, the trouble from interference and opposition in carrying out the artist's ideas will probably be more serious than the difficulties in the natural conditions of the double site.

The most interesting plant at the last monthly exhibition of the Massachusetts Horticultural Society was a hybrid *Cypripedium* shown by Messrs. Pitcher & Manda, of Short Hills, New Jersey, and named *Arnoldianum*. The plant was particularly interesting since it has been raised within two years, which is probably the quickest time on record for the flowering of a hybrid Orchid from seed. This rapid development is more surprising since *C. concolor*, one of its parents, is a very slow grower. The other parent is *C. Veitchii*, and the hybrid shows the form and color of both parents in its flower.

Germany now counts nine schools of forestry, some of which at least are connected with her greatest universities; and that the professors who instruct in this branch are as highly honored as any is shown by the fact that the rectorship of the University of Munich is now held by Dr. Hess, Professor of Forestry, while last year his fellow at Giessen, Dr. Gayer, held the same position there. Only two forestry-schools exist as yet in Great Britain, one connected with the University of Edinburgh, and the other with the Indian Engineering College at Coopers' Hill under the control of the Government of India.

The phylloxera has invaded the Department of the Marne, whence comes all the French champagne. The Prefect of the Department has sent a report on the subject to the Minister of Commerce, which leaves no room for doubting the evil news. He says that the Vines over a stretch of country extending from Vincelles to Treloup have a pale yellow tinge instead of their natural green, and that the small fibrous roots are covered with nodosities. The Minister has sent Monsieur Douette, a professor of agricultural science, who studied the phylloxera in the south of France, to Epernay. He is instructed not to hesitate, if he judges well, to apply the Government rules for stamping out the disease. The Prefect says the

whole country is terrified at the visitation. It is also reported that the phylloxera has appeared on the Rhine, and the vineyards at Mayence, Rudesheim, Bingen and other places are attacked and great alarm prevails among Vine-growers.

Mr. William Tricker writes that the flowers of *Nymphaea Mexicana*, which are now open in Staten Island, are much larger than those he took to the Boston Exhibition, and the plants are blooming more freely than those of Marliac's supposed hybrid, known as *Chromatella*. It will be remembered that Mr. C. G. Pringle, in our issue of August 27th, expressed a suspicion that this *N. Mexicana* is identical with *N. flava*. We hope that some one who has the good fortune to possess all three of these Water Lilies will take the pains to compare them and note their points of resemblance and difference under cultivation.

As an illustration of the influence of different soils and situations upon different kinds of Narcissus, the Rev. W. Wilks, Secretary of the Royal Horticultural Society, in a note on the Daffodil Conference, published in the Journal of the Society, says: One well known grower writes that Horsfield's variety never has given him one decent flower, although he has tried to grow it for a dozen years, while with Grandis and Empress he invariably succeeds. Another experienced grower writes that with him nothing equals Horsfieldii. The first grower lives on light, dryish, sandy loam, in the south of England, while the latter lives in the north, where rain is never a stranger and the soil is generally heavier.

A recent issue of the *Gardeners' Chronicle* contains an interesting account of the Alpine garden of Monsieur Boissier, which lies in a sunny nook in the Jura at an elevation of some 2,000 feet. The plants from high glacial regions flourish in the hot suns here because of the perpetual humidity which saturates the atmosphere from the evaporation of the abundant water which rushes down on every side. But damp as the air is, every provision is made to prevent the evaporation of moisture from the soil about the plants, and one of the means employed is worth notice. All the more tender species are surrounded by small stones, usually calcareous, and which, broken up into little pieces, cover the soil all round the plant. A splendid white flowered *Soldanella minima* was growing, covered with bloom, in a rock, which yet seemed excessively dry; this is a proof that these white stones scattered over the ground preserve the coolness and moisture of the soil, not only round the roots, but also round the aerial portion of the plant, the flowers and the leaves.

Mr. H. W. Wiley, the Chemist of the Department of Agriculture, has just published a bulletin concerning the cultivation of the Sugar Beet in the United States. The purpose of the bulletin seems to be to indicate the general principles which should be followed by those who intend to embark in this industry, and especially to prevent beginners from starting wrong and wasting time in an attempt to solve problems which have already been faced and overcome. From what is stated of the history of the industry in this country it appears that there have been many failures and few successes, and it is to be feared that the reports of remarkable profits in special instances may encourage many to enter into the business without adequate forethought and preparation. The methods of manufacturing sugar from the Beet have been so far perfected that there is no longer any need of public experiment in this branch of the business. The problem here is the agricultural one—that is, the selection of suitable soil under proper climatic conditions, and proper methods of planting, cultivating and harvesting the crop. In a general way, the coast valleys of California, and probably some large areas near the coast in Oregon and Washington, certain parts of the Dakotas and Nebraska, a few localities in Minnesota, Iowa, Michigan and northern Illinois, Indiana, Ohio and New York, seem to present favorable conditions for growing the Sugar Beet; but it is only in restricted areas where the conditions are exceptionally good even within these specified limits that we can hope for success. Many attempts have been made during the past twenty-five years to introduce this industry into the United States, and factories have been located in New England, Delaware, Illinois and California; but, with two exceptions, all these ventures have met with financial disaster. A factory at Alvarado, California, has been successfully operated for a number of years, and another one at Watsonville, in the same state, has been successfully operated for two years. From these successes it is reasonable to infer that others may succeed when all the proper conditions are supplied; but every attempt to erect a factory hurriedly or in a location where the capabilities of soil and climate are untried should be discouraged.

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The Language of Science.

NOT long ago we published a complaint that young persons were repelled from the study of botany because of the hard Latin and Greek names which were given to the plants. We have never discovered any basis for this charge, and find no reason to believe that the science would have more devotees under any system of nomenclature which could be devised. It is not meant by this that scientific names of plants could not be improved or that better rules for naming them could not be framed, but there is no evidence that the imperfections of the system are so serious as to deter any one from studying plants or to hinder to any appreciable extent those who have begun the study. A new charge, but one somewhat similar in its character, has recently been made, which perhaps deserves a word of consideration. In his address before the Florists' Convention (see p. 421), Mr. E. S. Carman, while recognizing the necessity of a plant nomenclature of general application, and therefore accepting Greek and Latin names as the best, stated nevertheless that the words which botanists use to express processes, conditions, etc., in the life of plants are so absurd, irrational and preposterous that the study of botany is rendered repulsive to these young people. Mr. Carman's paper was on hybridizing, and to prove his case he cited such words as "dioecious," "monœcious," "gyno-dioecious," "proterandrous," and so on, stigmatizing them as bombastic and abominable.

In the first place, it may be said that young people, or old people for the matter of that, who study botany as they should, and investigate plants themselves instead of learning lessons from books, have occasion to use scientific language only when they have some scientific ideas to express. Just as soon as one has a new idea there comes the necessity for a new word. Mr. Carman himself uses such big words as "organography," "morphology," etc., because he wishes to express a well defined science, and these terms have been selected for that use. He cannot express his meaning so distinctly and concisely in any

other way, and yet these words are as strange to the illiterate and to the young person as are any of those he uses to prove his case against the botanists. The fact is that the same charge can be brought against any other study. At the very outset of his arithmetical studies the child must become familiar with such hard words as "multiplicand" and "dividend" and "minuend," and in geography he is immediately confronted by "hemisphere" and "meridian," "equator," and many more which are quite as trying to him as any botanical term. There is no need of bringing illustrations from other sciences. Open any systematic treatise on birds or insects, on geology or medicine, and just as many "hard words" will be found as the botanists use. The reason for this is that scientific language is necessary in a scientific treatise.

But what do the critics mean by "hard words"? Not long words surely. If this question was pressed a little, perhaps the answer would be "words that are not in common use." But the subjects discussed are not subjects of ordinary conversation, and, therefore, there can be no common word to represent the ideas and processes in question. Perhaps Mr. Carman, who considers "dioecious" a hard word, would say that "deciduous" was an easy one. This is simply because the latter is more frequently used, but to the "young person" who learns them one is quite as easy as the other. But however this may be, the fact remains that it is utterly impossible to write a scientific treatise unless there are specific terms to represent the objects, the attributes and the processes which must come constantly under discussion. The only question is how should the words that are needed be formed. Now, the same reasons which make it advisable to use Latin and Greek for the names of plants, and in fact for technical names in all sciences, would seem to imply that the roots of these universal classics should be used in forming all the new words in scientific language.

This language is not constructed primarily to make science attractive to the young, but to furnish a means of complete and precise expression for those who are prosecuting particular studies. Any one with a slight acquaintance with Latin and Greek can easily form a word which will accurately express a new idea, and the reader will comprehend its meaning even if he has never seen it before. And many people who have never studied Latin and Greek, but who have become familiar with the roots of certain words which are often used in any given science, can not only understand new terms, but can construct them in correct form. Hugh Miller was not acquainted with any classical language, but he used the Latin and Greek terminology with all the facility of a skilled linguist.

Of course, all this is elementary doctrine, and there ought to be no necessity for such an argument even in a popular journal. But we believe that botany should be studied much more generally by young people than it is, and, while we have no fears that they will be deterred from it because scientific language is employed, we do have fears that some of them or their parents may be discouraged by careless criticisms, which magnify supposed difficulties, or by artful ridicule of the methods of the most advanced students of the science.

It may be that some of the criticisms upon the management of the Yosemite Reservation have been unduly harsh; but since the matter has become a subject of general discussion, and the plain truth is slowly appearing from out the mass of conflicting statements, it is growing more and more evident that the crowning charm of wild beauty which invests this valley is vanishing as swiftly as possible before the blighting touch of man. The details of the defacement are too sickening to recapitulate; but mutilated trees, meadows scarred with the plow, and acres of blackened stumps well justify the statement of John Muir, who has known this valley for more than twenty years, when he says in the *Century Magazine* that everything accessible and destructible is going more rapidly to

ruin here than in any other valley of the Sierras, although this is the only one under the special protection of the Government; and he adds that by far the greater part of this destruction of the charm of wildness is of a kind that can claim no right relationship with that which necessarily follows use. But the larger features of the park, especially its waterfalls and streams, are in danger from attacks upon the region without its borders. The time is at hand when lumbermen will begin to clear away the woods and herders will drive in sheep and cattle to browse and trample the life out of the ground, and the result will be that not only the valley will lose the frame-work of the surrounding beauty, but the streams which flow into it will become turbid and irregular torrents.

With these facts in view one can hardly understand why Congress should any longer delay action upon the bill offered by General Vandever, which extends the limits of the reservation so as to include the watershed of the important Yosemite streams and many beautiful groves and cañons, mountain lakes and meadows. The Act in its provisions is similar to the Tulare Forest Bill which has so recently been enacted. The enlarged reservation is to be under the control of the Secretary of the Interior, who is to make regulations for its management. Of course, the administration of the original reservation will continue in the hands of the state of California. It is not to be assumed, however, that the good people of that state will suffer its name for public spirit, and for an enlightened appreciation of the value of this sublime scenery, to be clouded much longer by the brutality of the men who are willing to barter away its unique beauty for the price of a hay crop. A rational management of the extension of the reservation must exert a wholesome influence on the management of the valley itself, and, therefore, the sooner the new reservation is established and put under national control, the better. This will not only preserve the rare beauty of the region about the Yosemite proper, but it will help to rescue the wonderful valley itself from deliberate ravage, which the civilized world would look upon as a calamity.

MR. WILLIAM LITTLE, who is a remarkably well informed lumberman, has published an open letter, addressed to the Montreal Board of Trade, on the wasteful mismanagement of timber lands in Canada and in this country. He says:

"Contrast the character of the timber manufactured at the present time, running largely into the different grades of culls, with the magnificent black walnut, black cherry, butternut, chestnut, hickory, buttonwood, whitewood, black and white ash, red and white oak, red and white pine which, when not used for fencing or fuel, were burnt up in the log-heaps of Ontario in Canada, and in New York, Pennsylvania, Ohio, Indiana, Michigan and Wisconsin in the United States, only a few years ago, and which, when manufactured, ran largely into the grades of selects and clear lumber. While hardly a thought is given to the matter by the people, we are almost face to face with a problem that must be quickly solved or disaster will surely and speedily follow.

"New lines of railway are being built or extended into districts dependent almost entirely on the timber trade for business; the carrying capacity of the lake marine is being increased at an enormous rate; cities, towns and villages, depending largely on the lumber industry, are enlarging their borders as if the supply was inexhaustible. But timber cannot be grown like a crop of corn; its growth is a matter not of years, but of ages, and when it is once gone it cannot be restored during the lifetime of those now living, while the really good timber of the north Atlantic and lake regions is not only not inexhaustible, as many suppose, but is actually almost exhausted.

"The forests of the vast territory extending from the confines of New Brunswick to the head-waters of the Mississippi are almost on the verge of immediate exhaustion, and yet, so ignorant or indifferent are the people of the United States to the seriousness of the situation, that they are even now higgling about what special restrictions they can impose upon Canadian lumber. Let them increase the duty by all means, if they like—the higher the better, in my opinion—for they will then the sooner know how grievously they have erred and

how imprudent they have been when they are compelled to pay these duties themselves, and Canadians are able to get what prices they want for their lumber.

"But if we continue to stock American saw-mills with logs, taken from our already too scanty supply, to forestall the markets in advance of our own manufacture, and keep slashing away at our timber as we have always been doing, overstocking the markets as if it were something to be exterminated at any cost, and with the Government, the capital, and, I may say, the public opinion of the country, when not indifferent, all arrayed against the forests and animated with the same destructive impulse, we will no doubt soon be able to get rid of the timber, and to get rid at the same time of the most valuable property we ever had, or may ever expect to have, in our country."

The American Elm.

WE published in the issue of June 11th a portrait of what may be considered a typical specimen of an American Elm (*Ulmus Americana*), planted by man, and allowed to develop during a hundred years all the grace and beauty peculiar to this tree. The American Elm, however, differs in its habit of growth considerably and assumes various forms as conditions are more or less favorable to its growth. A more recent number of this journal (Sept. 10th) gave an illustration of another form of this tree with pendulous branches which sweep the ground. A not unusual type of the American Elm is the one represented in our illustration on page 467. The trunk and principal branches of this tree are clothed along their whole length with short, lateral, feathery branchlets, giving to the tree the peculiar appearance which is well reproduced in our illustration. There seems to be no particular reason why some individuals should develop these lateral branches and why some should not. Many Elm-trees do it, however, and it is not an unusual sight to see two trees growing side by side under precisely similar conditions, the one with a naked stem and main branches, and the other clothed as fully as the tree of our illustration, which is, moreover, a remarkably fine specimen. It is growing on rich intervalle land in the town of North Sandwich, in New Hampshire.

We are indebted to Dr. William Herbert Rollins, of Boston, for the photograph from which the illustration has been made.

Effect of Forest-Mismanagement on Orchards.

I DO not intend here to rehearse the influence which the forest exerts upon fruit-culture by reason of its protection against cold and hot winds. The value of a properly disposed shelter-belt for the orchard is well understood. It is also well known that by opening up the country to the sweep of the northern winds the cultivation of the Olive in northern France was made impossible, and other such results of injudicious deforestation, of local as well as general character, are on record. I wish to show that not deforestation, but the mere mismanagement of the forest in the way of leaving large parts of felled trees in the woods and in allowing fires to run through the woods, works injury not only to the forest itself, but to the neighboring orchard. It is a well known fact that a large proportion of the beetle larvæ which infest living trees cannot exist in a thoroughly healthy and vigorously growing tree; those larvæ in particular which are found in the cambium layer between the wood and the bark would be drowned in the sap of healthy trees. They are, therefore, mostly found in those trees which, for some reason or other, are less vigorous or on the road to decay. When a fire has run through the Pine forest, or when a leaf-destroying caterpillar has ravaged the foliage and thus reduced the vigor of the trees, these beetles find a most favorable breeding place in the weakened trees, and their larvæ multiply rapidly and finish the work of destruction in short time. For this reason it is often necessary to cut millions of feet of lumber and cordwood at once, or it will be entirely ruined. While, then, these little insects—belonging to the families *Bostrichidae* and *Scolytidae*—are great enemies to the forest itself, there is no doubt that many of the insects injurious to our fruit and shade-trees find their most favorable breeding place in the trunks and limbs of the scorched or freshly felled trees. The frequent forest-fires and the failure of the farmer and lumberman in disposing of large parts of the felled trees must be considered as among

the principal causes of the prevalence in North America of these insect borers. The horticulturist may destroy the borers in his orchard or vineyard, but the mismanaged and maltreated forest makes a fertile breeding ground for them and replaces those destroyed by the watchful orchardist.

To substantiate the assertion, the following examples may be cited:

One of the most dangerous enemies of the orchard, the Flat-headed borer (*Chrysobothris femorata*) is found to breed in enormous numbers within the trunks of various forest-trees that have been injured by fire.

The Oak-pruner (*Elaphidium parallelum*), which does considerable injury to Apple-trees, is found under the bark and in the wood of Oak, Hickory, Elm and other forest-trees that have been recently felled and left in the woods or that have been reduced in vigor by fires.

Several other species of the same family, among which are *Prionus laticollis*, the broad-necked Grape-root borer, and others often injurious to the roots of the Grape-vine, breed in the trunks and stumps of forest-trees, especially Oak. *Pelidnota punctata*, a large Scarabæid beetle, which destroys the foliage of the Grape-vine, comes from the same breeding place.

One of the dangerous enemies to cultivated Blackberry-bushes, *Agilus ruficollis*, the red-necked Blackberry borer, preferably breeds and multiplies in the wild Blackberry and Raspberry bushes that have been scorched by fires. *Amphicerus bicaudatus*, the Apple twig borer, very injurious to Apple and other orchard-trees by boring in the twigs, breeds in the roots of the Smilax vines which have been killed by fire.

The various species of bark-borers of the Scolytus family, which attack orchard and shade-trees, could be readily kept in check, but for the fact that they breed unmolested and multiply in fallen forest-trees. Such are the Pear-borer, *Xyleborus Pyri*; the Pear-blight Scolytus, *Phloeotribus liminaris*, and the Apple Tomicus, *Monarthrum Mali*. This list of injurious insects, which find most favorable conditions for development in the mismanaged forest and threaten the orchard, vineyard, park and plantation, could, no doubt, be largely extended.

It would be difficult to tell what in amount the loss from these borers may be. We have learned that insect ravages entail the loss of millions. Thus the loss from the Cotton-worm was estimated in one year at almost \$30,000,000. And when we consider that the tree-borer does not destroy the year's crop only, but the crop-bearing tree itself, the accumulation of many years' growth and all the labor spent on it, we may readily see that, in proportion to the extent of orchards and vineyards, the loss must be considerable.

We have, then, here another illustration that all things in nature have their relation, and that if we interfere with their adjustment we are sure to throw them out of balance and suffer accordingly. We have another lesson, which teaches that cultural and forest-conditions are closely related to each other, and that, as we disregard proper forest-management in utilizing nature's gifts, we must bear the consequences in other directions.

Washington, D. C.

B. E. Fernow.

September in the Pines.

SOME flowering shrubs like Cassandra blossom with the first warmth of spring, while others in the same family hold their flowers back from one to four or five months later. Not only is this true of the shrubs, but herbaceous plants succeed each other in the most wonderful and varied beauty from early spring until late autumn. But by the middle of September flowers are scarce on shrubs and trees. Now and then we find a belated spike of Clethra or a fragrant cluster of White Azalea, but none the less attractive is a ramble among the Pines than it was when they were flushed with the glowing colors of the Laurel and Azalea or lighted up with the pure masses of White-Fringe and Dogwood, and fragrant with Magnolia and Wild Rose.

There is no dearth of flowers now, however, only their character is changed. Fragrance and delicacy seem to have given place to bold masses of azure and gold which blend with the gorgeous coloring of the ripening leaves of shrubs and trees. In damp places the Grasses and Sedges are starred with the lovely *Sabbatia* and purple *Gerardias*—the larger *G. purpurea*, the slender *G. tenuifolia* and the broader leaved *G. auriculata* are all here. The Meadow Beauty (*Rhexia Virginica*) is still a beauty, with blossoms and urn-shaped seed-pods. This species is common in all damp places, but *R. Mariana* is scarce here. For years I had vainly searched for this plant, and then to suddenly come upon it in a place which I had gone over many times was a surprise. The leaves are more narrow than are

those of *R. Virginica*, and the flowers are paler and somewhat smaller.

The closed *Gentian* adds its blue clusters of bud-like flowers to our collection, and a few long sprays of Swamp Loosestrife (*Nesaea verticillata*) are admitted as well as some bunches of purple *Eupatorium*. The little Orchid—Ladies' Tresses—must not be ignored, as some of them are delightfully fragrant, and prized all the more as its more showy companions lack this quality. The orange colored *Polygala* (*P. lutea*) is still abundant, and the purple heads of *P. sanguinea* are mingled with them.

Pond Lilies are growing luxuriantly in ditches which have been cut through Cranberry bogs. It is astonishing how quickly these Lilies find and appropriate such places, together with *Brasenia*, *Limnanthemum* and other water plants. Some parts of these ditches could not be more beautiful if they had been stocked and tended with the greatest care.

Great clumps of the Cinnamon Fern grow along the banks, and also the Regal Fern, together with *Woodwardia* and *Dicksonia*, and the Club-moss is creeping at their feet. The Ferns, too, find a place in our collection. By this time they are fully matured and do not wilt as they did in early summer. Now dipping our mammoth bouquet in water we place it in the shade and drive home for the next pleasure, which is the decorative arrangement of this wealth of material.

On the west side of one of my rooms are two windows that reach the floor with only three feet space between them. In this space is a small table. The windows are draped in white. On the floor in front of each window I set a large vase, in which are placed the tall Ferns, with a few long sprays of Golden-rod. The Ferns on either side reach the table, and are glorious in the full light and graceful amid the folds of the white drapery. On the table I mass smaller and more delicate Ferns with sprays of *Sabbatia*. This is the centre of an arch, and no description can do it full justice. The remainder of the collection find places in other parts of the house. Some of the brightest colors look well before neutral tints of heavy drapery.

But our crowning work can be made with the Water Lilies and the other water plants. With a large, old-fashioned tea tray and a good sized, shallow glass dish, with an abundance of Moss to conceal the tray and edge of the dish, one can make a pretty piece of decorative work or a bit of landscape gardening if you please. Beautiful little Sedges and small tufts of some of the wild Grasses are useful here, and tiny Ferns around the edge of the water are charming. All who have the time and inclination for this kind of work will find no end of diversion in such studies of artistic arrangement. And when completed, with a little care the miniature garden will last several weeks.

Vineland, N. J.

Mary Treat.

Botanical Work at the Stations.

THERE are now twenty-nine botanists employed at the various experiment stations, and several horticulturists are doing some botanical work. In the preparation of a bulletin, which is to set forth the character of their senders, a list of ten questions has been submitted to all of them, and the first of these questions is, "What botanical problems appear to you to be of most immediate importance in your state?" It is not to be expected that the problems calling for solution in Maine and Minnesota would be the same as those in California or Florida. However, in making a summary of the replies, one is surprised to find that far the most prominent subject named is "fungous diseases of cultivated plants." There are sixteen who announce this as among the most pressing lines for investigation. In addition to this, several name the particular trouble to be looked into; as, for example, the Peach yellows, bitter rot of Apples, Cotton blight (two), Sweet Potato rots. It is interesting to note that there has been a quite natural division of the fungous subjects among the botanists. Thus, for example, those of the prairie region are confining their attention mainly to the smuts and rusts of the coarser field grains, especially Wheat and Corn. In the south the leading subject for the fungologist is the Cotton crop, while in the central states the vineyard, and in the eastern states the garden crops and those of the greenhouse are more particular subjects of study.

The study of Grasses and forage plants is considered next in importance; some, especially in the far west, are testing the wild sorts under cultivation. The states engaged in this important work are as widely separated as Vermont, North Carolina, New York, New Jersey, Nevada, Nebraska, Minnesota, Michigan, Maine, Kentucky, Iowa and Colorado. In some

states it is the Grasses particularly that are under investigation, while in others the Clovers, Lucerne and other leguminous crops are being considered.

Next in order of importance comes the subject of weeds. How best to check their spreading can only be determined by a thorough knowledge of their habits; and their eradication calls for a concerted action that can be brought about by widespread information and an urgent appeal.

Following the weeds is the consideration of the long neglected subject of our forests and forest-trees, and next comes the question of plants for barren lands. This title is somewhat obscure, as it may mean forests or Grasses or some other plants of less intrinsic value to be used to prepare the way for something better.

But few of the botanists are engaging in the fertilization of plants, including hybridization and all that is understood by breeding. Three indicate this as one of the pressing subjects for inquiry. It is here again that the line of the station horticulturist approaches close to that of the botanist, and very likely a large part of the station cross-fertilization work will be carried out by the former.

Two have selected the relations of climate to vegetation, and two more testing seeds somewhat after the methods of the German seed-control stations. It has already been found that our seeds are not as foul or our seedsmen as vicious as had been alleged. In the far west two station botanists contemplate a study of the influence of irrigation upon vegetation. And still farther west and north, where state-making is not a thing of the distant past, the making of a state flora is considered one of the first things for the station botanist to do.

To come down to a small ending of the list, in more ways than one the returns show that at least one botanist considers bacteria among the more important subjects for study.

It is seen that the topics are broad and various, and for their satisfactory study there needs to be a wide diversity of talent.

Rutgers College.

Byron D. Halsted.

New or Little Known Plants.

A New Cornus.

A VERY puzzling Dogwood has been known for some time to be growing in the region of the Great Lakes. Occasional specimens received were referred to *C. stolonifera*, but not without contradicting some of its most essential characters. In an early day it had been collected by Bourgeau in the valley of Lake Winnipeg and along the Saskatchewan, and much later by Dawson, in the same region. It is also to be found among Garber's collections from Presque Isle. Macoun collected it at Point Pelee and Lake Nipigon, as well as in the Cypress Hills of the Northwest Territory.

In 1886, however, during a botanical survey of northern Minnesota, abundant material in fine condition was secured by Professor L. H. Bailey, and distributed by him as *C. stolonifera*, to which species Dr. Gray had referred it. Professor Bailey was well acquainted with this perplexing form about his early home in southern Michigan, and was never satisfied that it could be really *C. stolonifera*. The Minnesota material was collected along the north shore of Lake Superior, at Vermilion Lake, and at Hunter's Island, upon the British border. In a critical study of all the North American species of *Cornus* it became apparent that this perplexing form represented a distinct species, which was very naturally dedicated to Professor Bailey.* Its range, as at present understood, is about the Great Lakes, especially Lakes Michigan and Superior, and extending northward and north-westward into Canada. Its occurrence in the mountains of Wyoming, near Fort Bridger, suggests a possible southern extension in the mountain region.† The species can be distinguished from *C. stolonifera* by its erect habit, being not at all stoloniferous so far

* *CORNUS BAILEYI*, Coulter & Evans. Erect shrub, not stoloniferous, reaching a height of six or eight feet, with reddish brown, mostly smooth, branches; branchlets and inflorescence pubescent to woolly; leaves from lanceolate to ovate, acute or short acuminate, appressed-pubescent to glabrate above, white beneath and with woolly hairs variously intermingled with appressed ones; flowers in small, rather compact, cymes; fruit white; stone decidedly compressed, flat-topped, with a very prominently furrowed edge, much broader than high.—*Revis. of Corn. Bot. Gazette*, xv., 37 and 87.

† The Fort Bridger specimens were collected by the Hayden Survey, and named *C. pubescens* by Professor Porter, a decision which really came nearer the truth than *C. stolonifera*.

as known, by its much duller and browner bark, its pearly white fruit, with a large, flattened, square-shouldered stone, and by the white woolliness of the lower leaf-surfaces. It grows over the sand dunes about the lakes, "often in the loosest, shifting white sands," as Professor Bailey writes, and flowers continuously all summer, from June to September. As a handsome, long-blooming shrub, adapted to the sandiest soil, *Cornus Baileyi* well deserves cultivation.

Crawfordsville, Ind.

J. M. Coulter.

Foreign Correspondence.

London Letter.

THE fortnightly meetings of the Royal Horticultural Society have this year been exceptionally interesting and useful. Every meeting produces collections of plants of special value in some department of gardening, or some new introduction of more than ordinary promise. There can be no question of the important part such meetings play, or at any rate should play, in the diffusion of horticultural knowledge, for even connoisseurs find them instructive and interesting. In a previous letter I mentioned an exhibition of cut specimens of all kinds of spring-flowering, hardy trees and shrubs, supplied from the Royal Gardens, Kew, and several nurserymen who are strong in this department. Amongst these is the Messrs. Veitch, whose collection in the Combe Wood Nurseries is rich in rare and beautiful hardy trees and shrubs. Few meetings are held at which there are not specimens exhibited from this nursery. At the last meeting the exhibit consisted of a large collection of handsome-leaved hardy trees and shrubs, with a few autumn-flowering things amongst them. I noted the most striking of the plants, which are as follows:

QUERCUS DENTATA.—A Japanese Oak of extraordinary character. The leaves are fifteen inches long by nine inches in width, sessile, with large irregular lobes and almost leathery in texture. In autumn they assume a rich amber and red color. The young leaves are clothed with a soft down, which falls off as they mature, leaving them smooth and green. At present this plant is rare, but the size and beauty of its foliage, and the fact that it is quite hardy and grows freely even in the cold parts of Scotland, ought to make it a favorite.

SALIX ROSMARINIFOLIA.—This is an ornamental Willow with linear leaves five inches long, deep green on the upper surface, silvery beneath, the general appearance being that of a Rosemary, as indicated by the name. It is included by Hooker among the forms of *S. repens*, a British species, but he describes it as having leaves from two to three inches long. It is supposed to have been found by Sherard in the last century in bogs in Scotland. It is worth a place in every garden for the sake of its pretty foliage.

HYMENANTHERA CRASSIFOLIA.—A New Zealand shrub which has proved hardy in the south of England. It grows to a height of about four feet and forms a dense bush, covered with linear gray-green leaves, and in autumn with clusters of pearly white berries.

ARISTOTELIA MACULI.—In the south of England this free growing shrub becomes ornamented with a heavy crop of deep crimson berries, which change to black-purple when ripe. It is usually grown for the sake of its evergreen, handsome foliage. In sheltered places it forms a shrub about eight feet high. Messrs. Veitch exhibited branches of a variegated form, in which the leaves are partly bright, creamy yellow. If as hardy as the green form this should prove a valuable shrub.

LIGUSTRUM SIMONI, a distinct looking Privet in the way of *L. Japonicum*. The leaves are coriaceous, elliptical, deeply channeled and about five inches long. The inflorescence is a terminal panicle of small white flowers. It is said to be the same as *L. compactum*, a Himalayan species introduced in 1875.

CORNUS SPATHII is the garden name for a variety of the Siberian Dogwood (*C. Sibirica*). It is one of the handsomest variegated leaved shrubs we have seen, and if it proves as hardy as the type it will be a most valuable acquisition. As exhibited, it had leaves five inches long by three inches in width, and at least two-thirds of each leaf was colored a rich cream-yellow. It obtained a certificate in July of last year. The type is one of the most useful undershrubs we have, the crimson color of its stems, especially in winter, being particularly bright and cheerful. We do not succeed with the Dogwoods of America. *C. florida* we know chiefly from descriptions and pictures of it, for it does not flower here.

STEPHANANDRA FLEXUOSA, a monotypic genus allied to *Spiræa*. It was introduced from Japan to St. Petersburg by

Maximowicz some twenty years ago, but has been known in commerce only about seven years. It is hardy, deciduous, and has slender, flexuous branches with deeply cut leaves, which are pubescent beneath. The flowers are small, white, and are borne in large, loose terminal panicles. Altogether the plant is sufficiently striking to find favor as a hardy border shrub.

ALNUS TINCTORIA is a new Alder remarkable for the size of its leaves, which are about six inches long and broad, the

crimson. This plant is said to develop its color only when grown in pots under glass.

The summer bedding in the principal parks and public gardens in the neighborhood of London is this year unusually good. The year has been unfavorable in regard to weather, cold, sunless and wet days having been far too frequent to suit this kind of gardening. In spite of this, however, there are many successes and not a few of more than ordinary beauty. Hyde Park devotes a long stretch of ground bordering Park



Fig. 58.—*Cornus Baileyi*.—See page 464.

edges biserrate and the color a rich green. It is probably Japanese.

ACER COLCHICUM RUBRUM has Ivy-like foliage, which, when young, is colored rich crimson-brown. It grows quickly and forms a good-sized tree. It is one of the most attractive of the larger ornamental-leaved Acers.

Other noteworthy exhibits were *Styrax Japonica*, in fruit; *Cydonia Japonica Moorloosii*, which has the richest colored flowers of all the forms of this plant; *Daphniphyllum glaucescens*; *Salix laurifolia*, with large, glossy, dark green foliage, and *Ligustrum lucidum tricolor*, with large oblong leaves colored bright yellow and green, and when young tinged with

Lane entirely to summer bedding, which is always worth seeing and is especially good this year. The beds are very large, in shape either round or oblong, and they are separated by long sweeps of green turf, of which a wide strip runs from one end to the other. At intervals along this there are perfect specimens springing from the turf of Phormiums, Phoenix, Livistona, Bamboos and masses of Purple-leaved Canna. These prevent anything like monotony, and are, moreover, a very attractive feature in themselves. In the beds perhaps the most ornamental combinations are mainly due to a liberal use of Fuchsias of all kinds. Some of the beds are entirely filled with big half-specimen plants covered with flowers, and car-

peted with Mignonette, Iresine or Oxalis. Specimen Fuchsias, Heliotrope, Plumbago and Ivy-leaved Pelargoniums are grouped about on the lawn near the trees with excellent effect. An enormous bed is entirely filled with well grown specimens, four feet high, of pink-flowered Ivy-leaved Pelargoniums, with a few plants of variegated Maize scattered amongst them, the ground being hidden by a blue-flowered Viola. An edging of a narrow-leaved, elegant, variegated Coltsfoot Grass heightened the effect of a massive bed of crimson-flowered Begonias. Adrien Robini is an erect, glossy, crimson-brown Canna of great value for this kind of work. Chrysanthemum Precocité entirely fills several large beds, and proves itself a first-rate bedding plant. In another place there is a round bed twenty-five feet across filled with *Musa Ensete*, *Eucalyptus globulus* and Castor Bean, margined with a massive broad band of *Funkia Sieboldii*. Another bed of the same size is planted with the crimson Castor Bean and *Abutilon marmoratum*, edged with Silver-leaved Pelargonium and blue Lobelia. *Erythrina Crista-galli*, bordered with *Funkia grandiflora*, is an excellent piece of gardening, the vigor of growth and wealth of flower being perfection. Visitors to this park should not miss the fine piece of natural gardening on the east end of the Serpentine. The grouping of the trees and shrubs, the sweep of lawn, the planting of the stream border, which runs from the foot of a cascade—in short, the whole arrangement being delightful; wild rabbits and wood pigeons feeding quietly on the lawns add considerably to the naturalness of the effect. Large specimen Palms, Bamboos, Musas, Strelitzias, Cordylines and Tree-Ferns are tastefully arranged amongst the permanent shrubs.

Regent's Park is quite as good in its way. The most attractive beds are filled with *Celosia pyramidalis*, about a yard high, with heads of flowers as large as those of the Pampas Grass, and varying in color from pale yellow to deep crimson. Nothing could be more beautiful, the habit of the plant is so elegant and the colors so dazzling. These plants are raised from seeds sown toward the end of April, and they are grown under glass until they are in flower, usually about the end of July. They are then planted in the beds, and they continue in beauty until severe frost comes to cut them down. Cockscombs are similarly grown and bedded. The borders and beds generally in this park are finer, more tasteful in arrangement and better grown than I have ever seen them.

The same may be said of Hampton Court. One of the most attractive beds there is filled with a Begonia called Worthiana, which is by far the best bedder amongst tuberous Begonias. It is dwarf, forms a large tuft of branches with narrow foliage, and is heavily laden with bright scarlet flowers, which in form resemble those of *B. Boliviana*.

London.

W. Watson.

Cultural Department.

Notes on American Plants.

Hibiscus militaris (the Halberd-leaved Rose Mallow) begins to bloom later in the season than the common swamp Rose Mallow (*H. Moscheutos*). It is a smoother plant, with divided leaves, and its flesh-colored flowers are a little smaller than those of the other. Its natural home is on river-banks, while the other grows in marshes along the coast. But both do finely in ordinary garden soil, come into flower at a season when they will be most appreciated, and are always admired by lovers of flowers. Now that the Hollyhock disease is becoming so widely distributed, these Mallows, which seem to be less liable to attack, ought to become better known.

Gentiana alba (Whitish Gentian) is a fine native perennial for cultivation. It is rather rare, however, and difficult to obtain in large quantities. In Gray's "Manual of Botany" it is described as much earlier than the common closed Gentian (*G. Andrewsii*); but with us in cultivation there seems to be little difference in its time of flowering. The nearly white flowers are open, and in a thick cluster at the summit of the strong, erect stalks. It is a more southern species, and is very rare in New England, if indeed it is found there at all.

Aster corymbosus is one of the common species of wild Aster, which is useful for planting in dry, shaded localities. It is a low-growing species, seldom two feet high, and bears an ample, but loose, corymb of purple and white or yellow and white flowers an inch wide. The leaf is much like *A. cordifolius* in shape, but the zigzag stem is quite different. It is one of the easiest species to transplant.

Aster puniceus is one of the tallest species we have, often over six feet high, and bearing an abundance of its large, showy, violet-purple, or sometimes nearly white, flowers, over

an inch wide. There are varieties of this, smaller plants, with much inferior flowers, but in the true type the largest plants make a fine display when in bloom. It seems to prefer cool locations and a moist or wet soil.

There is a fine display of Golden-rods now in flower. *Solidago lanceolata*, with long narrow leaves and flat heads of small yellow flowers, is one of the earlier species. It seems to prefer moist banks. *S. latifolia* (Wide-leaved Golden-rod) has broadly ovate leaves and a zigzag stem, about two feet high, and bearing numerous pretty bright yellow flowers. Its wide and abundant foliage is of a dark shade of green, and contrasts well with the flowers. Another pretty plant is *S. puberula*, of sandy plain land, growing from one to three feet high, and bearing a dense, prolonged panicle of pretty yellow flowers. Another interesting species growing in cool peat bogs and on mountain-sides is *S. uliginosa*. Its stout stems are not rarely four feet high, and the long head or panicle of yellow flowers varies from six to eighteen inches in length in the largest specimens. The Sweet Golden-rod (*Solidago odora*) in its general appearance differs little from many others, but its leaves when crushed give a pleasant odor and an agreeable flavor when eaten. All of these are easily transplanted in early autumn, and do well in any ordinary garden soil.

Our native perennial Sunflowers are an interesting genus of plants, most of which are in flower about the first of September. There are nearly sixty species and varieties in North America, and no doubt many which have never been in cultivation are valuable for this purpose. *Helianthus giganteus*, one of the tallest, has rough and hairy stems, three to ten feet high, and numerous good-sized, pale yellow flowers. It does well in a light loamy soil, though its natural home is in wet, swampy land. *H. divaricatus*, in favorable localities, is a pretty plant, but in dry and barren soils, where it is sometimes abundant, it is not showy. Its height is from two to four feet, according to the soil from which it comes. Its flowers are good-sized and bright yellow, two inches or more wide. It is not so handsome or valuable a plant as the *H. discoloratus*, which has larger and more numerous leaves and flowers.

Southwick, Mass.

F. H. Horsford.

The Hardy Flower-Garden.

THE bedraggled appearance of the borders after a wet period, already reminds us that it is time to prepare for the next year's display of perennials. Where annuals have been used to any extent in the flower-garden, one now realizes more fully the ephemeral nature of their beauty, and determines that for the future they shall take a secondary position to plants of a more enduring character. It has already been noted that Narcissi are best planted at once, and the earlier the better. The same remark also applies now to all the members of the Lily family. To one who is just starting out to grow Lilies, the lists usually found in catalogues are long enough certainly, too long perhaps for a beginner, for many of the sorts included should never be planted by those who have not already had experience with this fickle genus. The list of Lilies which I have found to thrive perfectly in the climate of the eastern states would include *Lilium Batemaniae*, *L. Hansoni*, *L. candidum*, *L. croceum*, *L. pomponium*, *L. tigrinum* and varieties, *L. umbellatum*, *L. elegans*, also known as *L. Thunbergianum*, all the varieties of *L. speciosum*, often called in English lists and periodicals *L. lancifolium*, and, of course, *L. superbum*, and *L. Canadense*, with its pretty varieties. Every one should also try *L. auratum*, but no one should have great expectations of its longevity; I have yet to see the place where this gorgeous Lily has become established. In conversation with a large Lily-grower the other day he said, "To keep *L. auratum* raise your bulbs from seed." But this does not give much encouragement to plant the fine bulbs that are annually imported from Japan, which I have never known to increase in size.

There are other things which should be planted at once, such as *Mertensia Virginica*, one of the most beautiful of native plants, which will succeed in any soil. The Trilliums, too, are now offered and should be planted at once. Try them in shady places where other things do not thrive, but remember that they die down early in summer, and give place to something else, which may be planted along with them. There are many Trilliums, and some are not showy or desirable for garden purposes, but *T. grandiflorum*, *T. stylosum*, *T. ovatum*, and *T. sessile*, var. *Californicum*, are sure to please. Those who have not tried *Camassia Cusickii* certainly should; but remember to plant it deep. It is the best of the Camassias, but *C. esculenta* and *C. angusta* are both good border bulbs that need no coddling. Dodecatheons are now coming to the

front as garden plants, and they include the most beautiful plants of the Primula family that North America can show. The Dodecatheons are sold under a variety of names of garden origin ; but all are worth growing, even the poor, pale form of *D. Meadia*, now so often seen. Those who have not tried planting broken charcoal among the roots of Dodecatheons

so planted last fall was a brilliant spectacle this spring. There is a host of varieties of this fine plant, but none can surpass the type, judging from a dozen varieties we have tried.

German Irises are best planted now, and they will obtain quite a hold in the new soil this fall and flower stronger and better next year for the change. Starved-out old clumps of this fine old



A Feathered American Elm.—See page 462.

should do so ; it is said to deepen the color of the flowers several shades. *Primula Sieboldii*, one of the few really hardy Primulas, may now be planted with the roots near the surface. Strictly speaking, they are rhizomes and should not be covered more than an inch deep ; they need a good mulch of well-rotted manure, which may be left on in spring. A bed

Iris are too often to be seen in gardens. A pretty harbinger of spring is *Adonis vernalis*, whose bright yellow flowers are pleasing when there are few other than bulbous plants in bloom. It should be planted now. Alstroemerias come to hand in the fall, mostly from Holland, which is, by the way, about the only place where one can obtain these most ornamental

and useful of hardy plants. They should be potted as soon as received and placed in a cellar until spring, when they may be set in their permanent positions out-of-doors and become established so as to take care of themselves in future. It is not safe to trust newly imported plants of *Alstroemerias* to the severity of a New England winter, and the same may be said of the *Hellebores* which are thrust upon us at this season. These would speedily die if planted out when received. They must be protected in frames or in pots, and planted in spring. Afterward they can take care of themselves if a little mulching or covering of straw is placed about them.

The first frost will kill the tops of herbaceous *Pæonies*, and after that is the best time to lift and divide them or to procure new ones, remembering that *Pæonies* are, or should be, planted to stay, and the richer the soil is made the better the results will be in years to come. No garden should be without a few of the better named kinds, and those of French origin appear to be the best as a rule. Those who enjoy really good border flowers for cutting should try the *Trollius*. There are several species in commerce; the best of which are *T. Europæus*, *T. Asiaticus* and *T. Japonicus*. All three are distinct, and valuable for cutting. The flowers resemble huge Buttercups of a globular outline, which gives them their common name of Globe-flowers. They need a rich, moist soil.

I have found *Anemone Apennina* perfectly hardy, and it produces a charming blue flower, which opens early in April; but it takes two years to become well established. *A. blanda* is highly spoken of. It much resembles the Apennine Wind-flower, but blooms much earlier. *A. fulgens* I have known to live out all winter and flower gorgeously in spring. It is perfectly hardy in a cold frame, and is also fine for pot culture. These three *Anemones* are tuberous-rooted species, and may be procured now, as may the English and Spanish Iris, both of which are of the bulbous section known as *Xiphion*. These are rather fickle out-door plants, and ought to be wintered in pots in cold frames, and they will then flower beautifully in the border in May and June. In sheltered situations and more favored localities, both the *Anemones* and *Xiphions* would be fine garden plants.

If one has a corner of the garden where Grass or other things refuse to grow, Lily-of-the-Valley will thrive and is a good investment. If the bed is well and liberally prepared, they speedily take hold and thrive, and spread amazingly, where most other things fail. And, finally, every one should try the lovely native *Cypripediums*, and this is a good time to begin. Good, well-ripened crowns can be easily obtained and should be planted in a moist, shady place in rich mould. These Lady's Slippers also succeed well under pot-culture, and will do so year after year. *C. pubescens*, *C. parviflorum* and *C. spectabile*, with the lovely western *C. montanum*, with its raceme of sweet-scented flowers, are the showiest and best to grow. *C. candidum* and *C. arietinum* are both small, and *C. acaule* generally difficult to manage where it is not possible to imitate the natural conditions under which it grows.

South Lancaster, Mass.

O. O.

Notes on Shrubs.

Gordonia Altamaha (*G. pubescens*) is flowering in the Arboretum, the first blossoms opening about September 8th. The plant here requires covering in winter, but it is in a too exposed and rather unsuitable position for one of its kind. There are doubtless many sheltered gardens and nooks in the city of Boston and vicinity where it would survive our winters without protection and eventually become a good sized shrub. We are unable to grow the great evergreen or Laurel *Magnolia* of the south, but this *Gordonia*, or *Franklinia*, as it is often called, seems of a hardier nature, and is well worth a trial in favorable places. Our seasons are so short that the later flower-buds do not develop into blossoms unless protected from early autumn frosts; but, in any case, enough flowers are produced to fully repay the little care given to it and the space it occupies. The beautiful, pure white, delicately fragrant, single *Camellia*-like blossoms expand three inches across, and the cluster of stamens within is bright yellow. The corollas do not persist long, however, and usually become detached and fall thirty-six or forty-eight hours after expansion.

Clerodendron trichotomum is another shrub which in this latitude would be worth growing in sheltered situations, and would well repay any care given to it. This is a Japanese plant belonging to the *Verbena* family, and although it is a good many years since it was introduced into Europe it is still very rare in this country. In this climate the stems are

often so severely injured in winter as to seriously affect the blossoming. Last winter being less severe than usual, the branches were but slightly injured, and they now bear numerous cymes of sweetly fragrant flowers. This *Clerodendron* in its native habitat is a large shrub or sometimes a small tree. The branches are round, smooth and stout. The leaves are usually large, ovate, or sometimes cordate, pointed and more or less pubescent on both surfaces. When bruised they exhale a heavy and rather disagreeable odor. At a little distance the foliage resembles that of a small-leaved *Catalpa* more than any other familiar plant. The flowers are borne in large, much branched cymes on the ends of the branches. The blossom is white or sometimes slightly rosy colored, and expands about an inch across, and it bears four stamens and a slender pistil, which protrude about an inch from the mouth. The narrow, very slender tube of the corolla is about an inch in length, all the lower portion being enclosed in a loose, five-angled, purplish red calyx, which adds much to the showy effect of the flower, and which is conspicuous when enclosing the unopened buds as well as after the corolla has fallen. The flowers of a cyme open here in gradual succession, beginning about the first week of September. It is said that in Japan this plant grows high up on the mountains, and in rich soils produces panicles of flowers eighteen inches or more in length. It is possible that by getting seed from the extreme northern limits or the highest altitudes where this species grows, we may secure a race better able to withstand the severity of New England winters. Besides propagation by seeds, which will hardly have time to ripen in this latitude, this *Clerodendron* may be increased by cuttings from the shoots or roots.

An interesting plant for gardens is a *Clethra* from the southern states, to which Lamarck, in his "Botanical Dictionary," gave the name of the Cottony *Clethra*, or *Clethra tomentosa*, a name which was preserved by De Candolle in his "Prodromus" and kept up by Loudon and other early writers, although reduced to the rank of a variety of *C. alnifolia* by Michaux. It is a hundred years since it became known in European gardens. Later botanists, however, seem to consider it as but a mere form of the common Sweet Pepperbush (*C. alnifolia*), and we look in vain for any reference to it, either by name or description, in the last edition of Gray's "Manual." In some of the earlier editions of the "Manual," however, it is stated that "in the southern states are varieties with the leaves rather scabrous and pubescent or white-downy beneath."

Although the pubescent variety, which the earlier botanists knew as *C. tomentosa*, may not be entitled to specific rank in the botanical classification of to-day, it is, nevertheless, sufficiently distinct in the estimation of the horticulturist to merit some name which would indicate a difference from the ordinary typical *C. alnifolia*. In cultivated specimens in the Arboretum the leaves are larger than those of *C. alnifolia*. They are rugose above and densely covered with a grayish white tomentum beneath. In typical *C. alnifolia* the leaves are more smooth above and smooth and light green in color beneath, being quite destitute of any pubescence or hairs. The individual flowers as a rule are nearly twice the size of those of *C. alnifolia*, and they differ also in that the petals assume more of a bell shape and do not spread out so widely. The slender, pointed, terminal racemes of flowers average considerably larger, and many of them are supplemented by three or four well developed, but smaller, racemes, which, springing from the side near the base of the central one, come into bloom later than it does. To the horticulturist, however, the most important character lies in the time of flowering of the plants. Growing side by side in cultivation and under exactly similar conditions, the first blossoms of *C. alnifolia* open in the last days of July (July 22d in 1889 and 31st in 1890), while the first of those of what we may call *C. tomentosa* do not appear until three weeks later (August 12th in 1889 and 19th in 1890), by which time *C. alnifolia* is past its best flowering, although in woods and other cool places it is found much later. The latest buds of the tomentose variety are not expanded by the middle of October, so that they are usually destroyed by frost, and fruit is never matured. As this tomentose *Clethra* is only recorded from Virginia, Carolina, Alabama and other southern states, it is naturally not so hardy as our northern one. The flowers are quite as fragrant as those of *C. alnifolia*. On account of its extreme lateness in blossoming, this southern variety, or form, as it may be, seems likely yet to become recognized and valued by gardeners at least, and to find a place in every garden where shrubs of this class are prized.

Arnold Arboretum.

J. G. Jack.

Phajus Humblotii.

AMONG the representatives of the genus *Phajus* this charming species must be considered as standing in the first rank, and as a fitting companion of the handsome *P. tuberculosus*, already noted in these columns.

P. Humblotii (often erroneously spelled and called *Humboldtii*) is only just beginning to be known in Orchid collections, through importations from Madagascar last year by F. Sander & Co. The first appearance, however, of this species was in the year 1880, when only a few plants were imported through the agency of a young French traveler, Léon Humblot, whose name Reichenbach attached to the plant by way of commemoration. It is a somewhat difficult plant to get at in Madagascar as well as to import successfully, hence the lapse of nine years between the first and second installment.

The small, pear-shaped pseudo-bulbs have two or three rings around them, and are furnished with a few large, stalked, oblong-acute plaited leaves over a foot long and three or four inches broad. The stout, erect scape rises from the base of the pseudo-bulb and will bear as many as twenty flowers, which are individually about two and a half inches across vertically. The flowers appear in April and continue until the middle or end of July. I do not mean that one spike of flowers will last this length of time; but where there are several plants, each opening at different times, flowers may be seen for three or four months. In May last I saw nearly two hundred spikes with flowers expanded, and a very charming sight they presented. The ovate-acute sepals and petals are of a soft rose color, sometimes mottled with white; the large spurless lip has a nicely frilled rosy front lobe, and reddish brown spots thickly covering the pale yellow side lobes, while the bright yellow, saddle-shaped callus presents a striking contrast to the surrounding colors and immediately attracts the eye.

One variety is already known—viz., *P. Humblotii alba*, originally known as *P. Henryi*. This is distinguished from *P. Humblotii* proper in having pure white sepals and petals, and the colors on the lip less deep in tone.

The natural surroundings of *P. Humblotii* are malarial marsh-lands, where it grows at the base of large trees, according to its discoverer, Monsieur Humblot, with plenty of heat and moisture. An imitation of these conditions as nearly as possible (with the exception of the malaria) seems to be the best way to treat this plant in cultivation. A warm, moist house, with as much diffused light as possible, suits it admirably; the soil may consist of rich fibrous loam and leaf-mould, and pots, which appear to be most suitable, should be well drained. The plants rest a little during the winter months and require but little water; with the approach of spring, however, the young shoots push forth, and the quantity of water must then be daily increased to make the plants grow vigorously and develop their flower scapes.

London.

John Weathers.

Allamanda Schottii.—One of these vines occupies part of the roof on the west side of the plant-house here, covering 200 square feet. It is planted in a box three and a half feet long and two and a half feet wide and nine inches deep. The soil is a rich loam, and ordinary stove temperature is maintained, and in summer the plant is shaded from strong sun. With plenty of moisture in the air and water at the roots constantly, it never flags. A few applications of liquid manure when the box is full of roots, or a mulching of rich compost, is given, according to its needs. Being so strong a grower, it would soon have a starved look, and would produce smaller flowers with less generous treatment; as it is now, we have an average of 500 flowers open daily, and have had not less than 10,000 flowers this summer, averaging six inches in diameter.

Dongan Hills, Staten Island.

W. Tricker.

Dipladenia atropurpurea is an easily grown, free-flowering species, with trumpet-shaped flowers as large as those of the old *D. Boliviana*, but broader in the tube than that species, whilst the color is deep velvety crimson, except toward the base of the tube, where it is deep rose. This plant is almost forgotten now, but fifty years ago it was a popular stove-climber. Messrs. Veitch introduced it from Brazil, and it was awarded the Banksian medal as a new plant. Sir Joseph Paxton grew it at Chatsworth in combination with *Stephanotis*, a happy idea. The flowers last at least a week. It has been reintroduced by accident, a tiny plant having been imported along with a mass of *Cattleya* two or three years ago. It is now flowering at Kew. Other names for it besides the above are *Echites atropurpurea* and *Dipladenia violacea*.

Cyperus Natalensis.—A plant bearing this name has lately found much favor here among growers of decorative plants

for market. It forms an elegant tuft of smooth, shining, bright green, channeled, arching leaves from two to three feet long and erect scapes four or five feet high, bearing flower-heads similar to those of *C. alternifolius*, but larger. It seeds freely under cultivation. Grown in a moist, warm house, it soon forms a handsome specimen. It is a gross feeder, and thrives on frequent doses of manure. The value of the plant is in its fitness for decorative work and its sturdy constitution. It keeps its healthy green color for months in an ordinary dwelling room. According to Mr. Clarke, of Kew, it is certainly not *C. Natalensis*, but a *Mariscus*, allied to, if not a variety of, *M. sparganifolius*.

Kew.

W.

Grand Mogul and Jean Soupert.—While quite similar in habit and flower these two Roses are not identical—Jean Soupert was sent out by La Charme in 1875, and proved a very effective dark velvety Rose; Paul's Grand Mogul, of a recent year, is a seedling from A. K. Williams, and is a grand variety as seen in England. Neither of these three fine Roses does well in our country, probably on account of a lack of constitution to withstand our trying summer's sun; but wherever a grand, velvety crimson rose of the darkest and richest shade is desired our Rose-growers should plant Jean Liabaud; here we find freedom of growth, boldness of foliage, a rugged constitution and a flower once seen never to be forgotten—black and crimson displayed in a texture of velvet.

La France and Duchess of Albany.—Duchess of Albany is a sport from La France, and, while they have their resemblances, they are quite as distinct as Pearl and Sunset. By selecting a La France deeper in tint than the average and a Duchess lighter than its average one might hold in his hand two very similar Roses; but when the two are seen in a mass in any florist's forcing-house the most casual observer will note the new variety with admiration. They are quite similar in constitution, Duchess of Albany being the less liable of the two to drop its leaves; its bloom is slightly larger, too, under the same cultivation, while the color is a deep even shade of rosy pink without the light satiny sheen seen in La France. A dozen buds of Duchess make a cluster as distinct from a similar cluster from La France as a dozen buds of Catherine Mermet would be. Duchess of Albany is already highly appreciated among the florists as one of the most popular and most easily managed of the newer forcing Roses.

Richmond, Ind.

E. G. Hill.

[These notes from Mr. Hill were called out by the statement in an English journal that the Roses Grand Mogul and Jean Soupert are now recognized as the same, and that it would probably be proved that La France and Duchess of Albany were also identical.—Ed.]

Kniphofia (Tritoma) Corallina, just out of bloom, is one of the most desirable of the Torch Lilies or Red-hot-poker plants. It blooms freely for several months, and the flowers are most attractive, of a bright coral or orange red, without the clear yellow color on the lower side as in *K. Macowanii*, from which this is said to be a seedling. The plant is some five feet high and has a more spreading habit than the parent. Kniphofias cross so freely that it is interesting to raise seedlings from a collection, as many variations can be secured. *K. Corallina* bloomed this season from seedlings of 1889, quite in contrast to *K. Saundersonii*, which required three and four years' growth.

H. multiflorus, fl. pl., the double Sunflower most common in cultivation, is an excellent garden plant for a large border, vieing as it does with the African Marigold in bold effect of flower. It should be divided frequently, and unless grown in good soil the plants are much dwarfed. The perennial Sunflowers are all subject to attack of white mildew at this season and need attention with sulphur.

Helianthus lætiflorus follows closely in bloom *H. rigidus*, and is one of the best of native single Sunflowers. The habit is very neat, and the plant is about four feet high, producing a plentiful supply of deep yellow flowers of firm texture and some four inches in diameter. The disc of this species is yellow, or rather the purple base is covered with yellow anthers, which is the chief distinction between this and *H. rigidus* (the Prairie Sunflower), sometimes known as *Harpalum rigidum*, the disc of which is deep purple. The latter variety is also an earlier bloomer, coming on in July and August. A variety received as *H. Japonicus* is very slightly different from *H. rigidus*, to which it is inferior. A lot of seedlings from *H. rigidus* are decidedly inferior to the type; of a distinctly lighter

color, and, curiously, have less of the rambling tendency at the roots so characteristic of both of the above named varieties. They are both propagated by underground stolons, which ramble in all directions; and as the old stool dies annually one not familiar with this habit would conclude early in the season that the plants were lost. They are perfectly hardy, however, though disliking too much wet.

Helenium autumnale.—This showy yellow Composite is daintily sketched by Mr. Gibson in the current number of *Harper's Magazine*. It is so seldom seen in cultivation that attention should be called to its beauty and merits as a plant for the back border, where in August and September its many-branched heads of golden yellow flowers are very bright and attractive. The plant is a vigorous grower, four to five feet tall and a profuse bloomer. The individual flowers are from one and a half to two inches in diameter, entirely golden yellow, with a round button-like disc, from the lower half of which the flat, blunt petals slightly droop. Like many of our native plants, this Sneezewort is more appreciated abroad than at home. A dwarf variety is offered as *H. pumilum*, which is said to be an improvement on the type. My plants are seedlings from this variety, but apparently not true, as they differ little from *H. autumnale*, except in being somewhat improved in cultivation.

Desmodium penduliflorum, now in bloom, is one of the most graceful habited of hardy herbaceous plants, with a beautiful combination of flowers and foliage, though quite unattractive earlier in the season, when the leaves have an ugly habit of folding together in all dry spells. The flowers are a bluish red, but even with this drawback the plant is well worth growing for its distinctness and contrast to the usual showy autumnal flowers.

Elizabeth, N. J.

G.

The Forest.

Preserving Small Forests.

THE greatest obstacle in the way of securing efficient action for the preservation of the public timber-lands arises from the lack of personal interest in the work. The public forests are spread out over a wide extent of territory; their character and condition are only partially known to the mass of those living near them, while the bulk of the people resident at a great distance from them know hardly anything about them and feel little interest in them. It is only the comparatively few who take broad views of things and feel that what concerns the public concerns them, and so are ready to make the public interest their own.

In the case of private forests there is no lack of personal interest. But the difficulty here is that the interest is so limited in duration that there is no adequate motive for a proper forest-management, while the limited extent of individual holdings usually prevents any such continuity of woodlands as will secure the best forest-results. Our system of land-tenure is such, and the habit of the people such, that any parcel of land may pass into the possession of a new owner at any time. The prospect of pecuniary gain or relief from a pecuniary exigency, however temporary, is enough usually to occasion the transfer of land from one to another, and most land-owners in this country hold their lands in the consciousness of such uncertain and limited tenure. Of course, the motive for planting or properly caring for woodland is correspondingly weak. Then, also, the length of time requisite to bring trees to their maturity operates as a discouragement to effort or outlay in planting or managing forests. The planter stands dismayed before the slowly rounding cycles of the Oak or the Pine. If we had a system of entails it might be different. Then one would feel that though his own life might soon come to an end his efforts and expenditures on his estate would not be wasted, but would accrue to the benefit of his family, his children and his children's children.

What is needed in our country, therefore, for the most successful dealing with trees in masses, with forests, is a personality whose life is as lasting as that of the trees themselves. The nation is such a personality. It lives on without any assignable or necessary limit to its duration. Hence the nation or state can care for the forests in the best manner and use them to the greatest advantage and with the highest profit in all respects, as is seen by the forest-management of European countries. So, also, there are lesser communities having such an unlimited duration of life, such as counties, towns, parishes and precincts. So, likewise, there are various corporations created by law which have no necessary limit to their life. Trust companies and guilds of many kinds are such. They can properly undertake any enterprise, no matter

how much time it may require for its accomplishment. To such an unlimited life to grow a forest, even of Sequoias, is no more than for an ordinary person to grow a crop of Corn.

Why may we not avail ourselves of this larger, longer life for the establishment of forests something like the communal forests so frequent in Europe? While encouraging every farmer and land-owner to preserve a portion of his existing woodland and to plant shelter-belts, at least, why may not our counties and towns as such establish and maintain forests? In many of our counties and in many of our towns there are tracts of land, sometimes of large extent, often comparatively small, but many in number, which are unfit, perhaps, for ordinary cultivation, because they have a stony soil or are swampy and not easily drained, or lie upon steep hill-sides. As they are now they do not yield more than enough to pay the taxes assessed upon them. But while thus unprofitable in their present condition they could all be profitably used for the growth of forests; and why should not the county or the town—that is, the whole people in their corporate capacity—utilize such tracts by taking them out of their present unprofitable condition and devoting them to a remunerative forest-growth? In many cases such tracts would be given to the county or the town; in any case they could be bought at a very low price. Where there are several small patches of woodlands, or lands partly wooded, but separated from one another, these isolated wood-lots are useful now only for their small yield of fuel and inferior timber. If they were in the possession of the county or the town they could be combined, the necessary connecting land also being taken, so as to form such a continuous stretch of woodland as to possess more or less of the qualities of a forest, exerting climatic and other influences. Such a forest would also warrant better management and be more productive than smaller parcels. From time to time, also, the county or town could extend this forest-area by gift or by purchase, as the private person adds to his land, and as is done, in the case of their larger forests, by the European states.

Another advantage which would be gained by the town or county forest-system would be the more efficient protection of such forests. They would be protected from fire and other injury as no strictly private forest or forest belonging to the General Government would be; for the whole community would have an interest in watching them as their personal property; for every citizen would be an owner, and if fire should by any chance break out in such a forest, every one would be prompt to assist in extinguishing it.

Such forests could be cared for and maintained at a minimum of expense and a maximum of profit. This would be as the result of the general law, that a large business is more economically managed, proportionally, than a small one. The proprietor in this case, the town or county, or trustees or other corporate person, would always be able to command the requisite labor at the proper time. The work would be done under no such stress for immediate results as often urges the private land-owner; therefore the work would be done the more cheaply. If an existing woodland or several tracts were thus taken in hand, the necessary thinning could often be secured with little or no outlay of money.

There can be little doubt that a fair rate of interest on such an investment as this could be secured. Examples of the management of such limited and local forests abroad indicate this very plainly, while the sanitary influence upon adjacent agricultural lands would also properly be taken into account, and their general climatic effect, whenever they were of considerable extent.

Such forests would also incidentally become valuable as experiment stations, where many kinds of trees would be tested on whatever varieties of soil and exposure the grounds might furnish, and thus every landholder around might learn much as to what trees it would be most desirable for him to plant on his own premises.

A nursery would also, naturally, be a part of the equipment of such a forest, for the purpose of rearing trees to fill the places of those cut from time to time. And this might easily be made a source of revenue, by the sale of young trees to the land-owners of the town or adjacent region.

Finally, such a forest might have a value over and above any of a pecuniary kind, by being made a place of pleasant resort for the whole community—a place of special meetings on various occasions and of healthful recreation at any time. Thus the people would cultivate their forest, and it in turn would cultivate them, developing in them a taste for natural objects, opening their eyes to new beauties and new sources of delight, dwelling them together in society and endearing to them their dwelling-place more and more with the passing years.

Washington, D. C.

N. H. Eggleston.

Correspondence.

Some Northern Ferns.

To the Editor of GARDEN AND FOREST :

Sir.—The rarer Ferns found sparingly in the northern limits of the United States, but more generally in the eastern provinces of Canada, are generally away from the beaten tracks of tourists—amid mountain glens, in the neighborhood of waterfalls or nestling quietly on shaded cliffs above the reach of any but the most venturesome climber. The pretty little *Asplenium viride* is exceedingly rare. I have only met with it in the neighborhood of St. John. Here it is found in comparative abundance, in some half dozen places, hiding in the clefts of limestone rocks, and defying any but the most Fern-loving eye to discover its retreats. A few friends who have occasionally accompanied me to my “preserves” have been successful in its cultivation, and I have never seen it more beautiful even in its native haunts than it appears in a dainty dish in a friend's house. Two years ago the plant was set in a moderately deep glass dish with the small amount of earth which was gathered from the cleft of rock in which it was found growing. An occasional spraying of rain-water, with care to drain off the extra moisture that had gathered in the dish, is all the attention it has needed.

Pellaea gracilis I have seen only in the northern part of New Brunswick, in the neighborhood of Grand Falls and Woodstock and one or two of the tributaries of the St. John River. I shall never forget the sight that once met my eye on a projecting ledge of that most beautiful of New Brunswick rivers—the Madawaska. Growing from the clefts of rocks, and lifting up its delicate, pale green fronds on the grassy slope of the bank in the greatest profusion and luxuriance, the whole spot of wonderful green could have been covered by my umbrella. I had never seen the Fern before, and I have seen it but once since, but that exquisite little picture in the wilderness, with surroundings in perfect harmony, is a joy forever.

Scolopendrium vulgare is found in one locality in New Brunswick, but just where is unknown to me. Ten years ago the gardener of Mrs. Charles Connell, Woodstock, discovered the only specimen that has been seen in New Brunswick. A few Fern-lovers have searched diligently for the coveted prize in all the shaded ravines for miles around, but as yet without success.

A few weeks ago a party of adventurous students of the Nova Scotia Summer School of Science started one morning to find Moose River Falls in the recesses of the Cobequid Mountains. Adventurous, I say, because only one lady had ever visited the falls before, and here were at least twenty accomplishing the feat of scaling mountain heights, toiling through ravines, to catch a glimpse of one of the choicest bits of scenery to be found in eastern America. The Moose River, rising amid the heights of the Cobequid Mountains, acts much like other mountain streams at first, but suddenly makes a series of three or four mad plunges, the last and greatest being a leap of about a hundred feet into a basin in the form of an amphitheatre whose walls of perpendicular rock rise to the height of over 300 feet from the bed of the stream. Far up in the clefts of the rocks could be seen at least one *Woodsia* (perhaps *Ivensis*) and *Aspidium fragrans*, which I had been trying to find for several years and now saw for the first time. It is found in two localities only in New Brunswick, and this was the second for Nova Scotia. Mr. A. H. Mackay found it again a few days after at Minnehaha Falls, another picturesque glen of the Cobequids, along with *Asplenium Trichomanes*, which, although described as common in Gray, has never been found in New Brunswick and but twice in Nova Scotia.

St. John, N. B.

G. U. Hay.

Insect Enemies of Ampelopsis.

To the Editor of GARDEN AND FOREST :

Sir.—The Vine on my house, Japanese Ivy, has been devastated during the past summer by a green worm of considerable size. Many other houses on this street are similarly afflicted. It is gradually becoming a serious pest. Can you suggest any remedy? Is there any liquid application that could now be made to the roots of the Ivy that would kill the creature in its present state?

Beacon Street, Boston.

A.

[In the absence of specimens or more exact information we would say that the injuries referred to are probably caused by the caterpillars of the so-called eight-spotted Forester (*Alypia octomaculata*), an insect which has some-

times caused much disfigurement to the foliage of both Japanese and American species of *Ampelopsis* in Boston and other cities. The moth which deposits the eggs which hatch into the troublesome larvæ expands from an inch to an inch and a half across the wings. It is of a velvety black color, and is marked by eight large conspicuous spots, two on each front wing being pale yellow, two on each hind wing being white. Unlike the great majority of moths these fly in the day-time, and observing persons, when crossing the Boston Public Garden, cannot have failed to notice these insects as they fluttered about the flowers of the dwarf Mountain Ashes, the dwarf Deutzias, the Spiræas and other plants in the latter part of May and in June. Where this insect causes serious injury to the *Ampelopsis* the moths should be caught and destroyed whenever possible. In destroying the caterpillars hand-picking may be tried on small plants. Where hand-picking is out of the question insecticides must be tried. Fresh Pyrethrum powder may be dusted on dry from a hand-bellows made for the purpose, or used in a liquid form by spraying with a strong syringe or a force pump. This insecticide kills by contact, and not by being devoured, and may be used without fear of injury to persons. White Hellebore may be found more efficient, as the caterpillars are poisoned by eating it, and it also may be used dry or in water. In a liquid form this and the Pyrethrum may be used at the rate of a tablespoonful to a gallon of water. Although a poison, the Hellebore is not nearly so dangerous as London Purple or Paris Green would be.

Kerosene emulsions might be equally effective, but these and the arsenical poisons, in inexperienced hands, are liable to injure the foliage, whereas the first two can do no harm to the leaves. The remedies should be applied as soon as the caterpillars are found on the Vines, usually early in July, and they should be repeated if found necessary. The pest cannot be destroyed by applications of anything to the roots of the plant.—Ed.]

Practical Aid for Forests.

To the Editor of GARDEN AND FOREST :

Sir.—Professor W. A. Buckhout's article on “Restoring Wasted Forests,” in your paper of August 20th, is one of remarkable interest and value. All its suggestions are excellent, and if they were heeded there would be little need of forest-tree-planting in the eastern states. The idea of the use of trespass notices is sensible and practical, and along with them a brief educational appeal of fifty or a hundred words, a request and a reason for being careful, printed in large, plain type on some durable material, and fastened to the trees everywhere, would soon have an improving and perceptible effect. There is still a good deal of common sense in the world, and it responds to effort of this kind. To make an enduring and fruitful impression on a community regarding a new subject requires time, and, especially, it requires much repetition, but it can be done by the use of such means, and the sooner we begin the sooner we shall accomplish something.

And now, particularly, I know of nothing else so effective which would cost so little as to reprint this article of Professor Buckhout's in a “slip,” to send to the people who are interested in forestry-matters—or who ought to be—everywhere. We could all use it in our letters, and the distribution of a few thousand copies would exert an influence. It would be doing something, and until we do something we do not improve things very much.

New York.

J. B. Harrison.

The Pepino.

To the Editor of GARDEN AND FOREST :

Sir.—In answer to Dr. Sturtevant's inquiry as regards the Pepo of Peru, I can say it is probably identical with the Pepino of Central America. This *Solanum* fruit is of the size of a hen's egg or a goose egg; tastes like a melon with a very fine acid; allays thirst readily. I introduced this plant some seven years ago, and it has been tried in various parts of the United States. It has only succeeded in Florida, but has there proved of considerable value. It is one of the finest fruits of the highlands or cooler parts of the tropics.

California Academy of Science, San Francisco.

Gustav Eisen.

Notes.

The large, bright red, cone-like fruits of *Magnolia umbrellata* are now very attractive.

While in almost every other part of the country the Apple crop has signally failed, the trees in the mountain valleys of western North Carolina are loaded with fruit.

Monsieur Edouard André, the distinguished landscape architect of Paris, and one of the editors of the *Revue Horticole*, is now in Montevideo, where he has been called to execute some important public works.

From a recent number of the *Anales* of the University of Quito we learn that a new *Acrostichum*, found on Mount Pichincha, in Ecuador, at an elevation of more than 10,000 feet, has been named *A. Yatesii*, after Dr. Lorenzo G. Yates, of Santa Barbara, California.

In our notice of the hybrid *Cypripedium Arnoldianum* last week it should have been stated that Messrs. Pitcher & Manda received for it the silver medal of the Massachusetts Horticultural Society. At the same exhibition a certificate of merit was awarded to the Cambridge Botanical Garden for a fine collection of flowers of one of the night-blooming *Cereuses* (*C. triangularis*).

A pleasant, but rather pathetic, incident that occurred during the meeting of the Forestry Association at Quebec was the visit of the old Huron Chief Sioui and his son in full Indian dress. He was introduced by President Joly, and made the following address: "We are the children of the forest, come to welcome the friends of the forest. I wish you, for my people, joy and success in your good work. When I was a child I lived in the forest; I have always lived in the forest, and I wish to die there. My people are few in number; we are dying away with our home, the forest. Protect us and our home, and you will have the prayers of the Hurons and the gratitude of their hearts."

Perhaps no paper read at the meeting of the Forestry Association at Quebec excited more general interest than one by Mr. Auguste Dupuis, of St. Roch des Aulnais. In this far northern latitude, under unfavorable conditions and at his own expense, Mr. Dupuis has carefully tested almost every variety of tree, both native and foreign, which gives any assurance of success. The results have been carefully noted, and they furnish data that will be invaluable for those wishing to plant trees in the far north. This work has been patiently carried on for many years, and the failures are quite as instructive as the successes. It is the kind of work that ought to be commenced at once at the different experiment stations of the United States.

The annual fruit and vegetable show of the Massachusetts Horticultural Society last week proved an entire success. The vegetables were all of superb quality, and the abundance and excellence of the fruit was remarkable in spite of the discouraging season. One of the most attractive features of the display was the greenhouse grapes from the gardens of Mrs. Lassell, of Whitinsville (Geo. McWilliam, gardener), and Mr. N. T. Kidder, of Milton. Mr. Robert McLeod, gardener to Mr. D. B. Fearing, of Newport, Rhode Island, showed some samples of the Late Crawford peach, which were marvels of orchard-house culture. The extensive collection of miscellaneous fruits from the Massachusetts Agricultural College at Amherst was both interesting and instructive. It would be a good thing if such institutions would more frequently demonstrate their utility in a manner so practical. A rich display of ornamental fruiting shrubs was made by Mr. Jackson Dawson, of the Arnold Arboretum. It represented a host of beautiful and desirable things.

In the Government Crop Report for September the following statement is made by Mr. T. W. Clark, a statistical correspondent for Marathon County, Wisconsin: "The northern half of Wisconsin is one vast berry patch. Strawberries grow profusely in their season; following them comes the Blueberry during the months of July and August, this crop amounting to hundreds of thousands of bushels. Some black Raspberries and a few Service-berries are found. The red Raspberry, Blackberry and Dewberry yield thousands of bushels. Carloads of glass cans are used annually in preserving these for winter use. Thousands of people find occupation in harvesting these spontaneous crops of luscious fruit. The Cranberry comes to perfection in September, rounding out the season. The value of the wild fruit utilized in northern Wisconsin is estimated at \$1,000,000. Three or four times as much goes to waste for want of pickers. The exceeding healthfulness of

this portion of the country may be attributed in a great measure to the purity of the water and the profusion of fruits."

Some time ago we spoke of the fragrant Ferns which New Zealanders used to scent their oils and other articles of food. An English florist, Mr. John Dutton, writing of one of these, *Polypodium pustulatum*, in a local paper, says: "The dry fronds of this Fern, placed in rooms or in books, give off a most agreeable perfume, which lasts for years and greatly resembles the odor of the Heliotrope. This scented Fern, it appears, was held sacred by the natives, who for a long time kept the secret to themselves. It grows in the forests on the west coast of New Zealand, and also in the North Island, but in neither place is it common. One or two varieties are met with occasionally, in one of which the fronds are forked, and in another they are lobed. The perfume appears to be strongest on the sori-bearing fronds. This species was introduced into England in 1820, but has, it seems, quite dropped out of commerce, for we have not found it mentioned in any trade list. It would be interesting to know more about it, and whether, if it is still cultivated in this country, its fragrance is as marked as when growing in its native habitat."

Mr. Watson gives in the *Gardeners' Chronicle* a remarkable instance of tenacity of life in a Yucca. Nearly two and a half years ago the trunk of a Yucca, probably *Y. elata* (see vol. ii., p. 560, fig. 146), was received at Kew from Mr. C. G. Pringle as a specimen for the Museum of Woods. It measured fourteen feet in height by one foot in diameter near the base. There was not a vestige of a root upon it, and the top had been sawn off. It was at once placed in the museum, where, of course, the conditions are almost as dry as an oven. A week or two ago two shoots were seen growing out from the top of the trunk, one composed of leaves, the other of flowers. On examination the whole of the trunk proved to be full of sap and as succulent as if it had only just been dug up from the ground. It was, therefore, removed to the temperate-house, where it may now be seen in flower. *Y. elata* is peculiar to the dry desert region west of the Rocky Mountains, between the United States and Mexico. It has erect, stiff, filamentose leaves, and an erect flower-spike ten to twelve feet high; the flowers are four inches across and pure white.

In a San Francisco dispatch to *The Tribune* it is stated that although this is the best year ever known in California for producers of fruit, the fruit-packers will suffer heavily, because of their contracts to deliver dried and canned fruits for about one-half the ruling rates. Early in the season, when reports came from the east of the total failure of fruit, they discredited those concerning the Delaware peach crop, and made contracts on the usual terms for the delivery of fruit this fall. The result is that they are now paying ten cents a pound for prunes which they have agreed to deliver for five cents. The same rates hold good in regard to peaches, pears and other fruits. One large packing firm will lose \$50,000 on prunes alone, while several smaller ones will probably go under, as they will be unable to stand the losses. It is a great year, however, for fruit-growers, as prices are about double what they usually are and the crop is large. Even grapes, which have been a drug on the market for several years, bring high prices. Ordinary Zinfandel wine grapes fetch \$20 a ton, and large quantities not used for wine have been dried. These will be introduced this winter at the east for stewing and as a substitute for currants.

A month ago we published an account of the famous Holgate Nurseries of James Backhouse & Son in the ancient city of York, and now, with sincere regret, we are called upon to announce the death of the head of the firm. Mr. James Backhouse was more than a nurseryman, for he had inherited a love of botanical science from his father, who, together with his uncle, became the proprietors of the nurseries seventy-five years ago. In early life Mr. Backhouse published a "Monograph of Hieracia," and the close observation which was displayed in that work has characterized his methods of business and study through life. He began to import and cultivate Orchids among the first, and his collectors in various tropical countries discovered many of the best species in cultivation. Besides Orchids special attention has been given at the York Nurseries to the cultivation of Ferns, Conifers, herbaceous and especially alpine plants. The rock garden of this establishment, where these alpine plants are collected and have been cultivated with remarkable success, is one of the best specimens of this class of work, and the plants are very tastefully arranged in the crevices of the immense pile, which rises at times to the dignity of a cliff. Mr. Backhouse was sixty-five years old at the time of his death.

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Forest-Fires.

A RECENT Washington dispatch announces that a bill to protect the trees on Government land from destruction by fire has been occupying the attention of the Senate. It certainly is high time that Congress should take some action in this regard, especially since the season is at hand when conflagrations in these forests on the public domain are most common. The law simply provides that any person who shall maliciously or negligently set on fire any woods, underbrush or prairie on the public lands of the United States, or who shall suffer any fire which he may have lighted on other lands to pass therefrom to the public lands, shall be guilty of a misdemeanor, and upon conviction in the District Court of the United States shall be fined a sum not more than three times the value of the property destroyed or injured, or imprisoned for a term not more than three years, or both. When this bill or a similar one was up for discussion a few months ago its constitutionality was questioned on the ground that the General Government had no authority to create any offense in a given state except on lands where it has exclusive jurisdiction. In other words, the United States has no more right to say that it is a criminal offense to burn timber in a given state than it has to say what shall be larceny or other misdemeanor on the public lands in the same state. Of course this denies to the Government the right of protecting its own property, and it is plain that common sense legislators, if they are in earnest about the matter, can devise some enactment which the courts will recognize as authoritative. The real obstruction which stands between these incendiaries and punishment will be, as it has been in the past, a lack of intelligent interest on the part of the people and of a strong public opinion behind any law to insure its enforcement. Until that opinion develops laws will be of little value, but if the time comes when the people of the country realize the value of its forests and their personal interest in them as a part of their inheritance, there will be no difficulty in making laws whose constitutionality will not be questioned by even the most strict constructionist.

In the civilized portions of Europe there is no longer any serious danger from forest-fires, because every one hastens to extinguish them as soon as they are started, and the Government can call out the whole force of the country to assist. But in less highly organized society the forests suffer from fire exactly as they do on our western frontier. From a recent number of *Akhbar*, a daily journal of Algeria, we learn that the Arabs are hardly more civilized than our own citizens. Half a column is filled with the record of a score of forest-fires all raging at once in different parts of the country. In one place 800 acres of Cork Oaks are swept away. Not far from this 5,000 acres more have been devastated. In an adjacent district 3,800 acres of forest are burning, and the woods of the entire province of Constantine are said to be in flames. There is nothing novel in these sweeping conflagrations. The Arab, like our own herder, sets fire to the brushwood either to make a clearing or to encourage forest-pasturage for his flocks and improve his hunting grounds. In 1865 a single fire lighted by a shepherd swept over 4,000 acres. In the three years from 1884 to 1887 more than 1,000 fires were started, which burned over 300,000 acres, and until these people realize the value of the forests to them the entire 7,500,000 acres of standing timber in Algeria must be threatened; and this means the possible destruction of the most important of the natural sources of wealth of the country, to say nothing of its influence upon the climate, and, through the climate, upon agriculture and the general prosperity of the country. Altogether these African Arabs seem to be doing the best they can after their feeble fashion to imitate the robust and exuberant incendiarism of our own people.

It may not be out of place here to recall the fact that fires sometimes destroy forests which have more than an economic or climatic value. Perhaps no forest in the world is more interesting from historical reminiscences than that which clothes the slopes of the Pentelicus Range and overlooks the City of Athens. These groves are associated with the familiar names of the great heroes and philosophers and lawgivers who retired to their shade for rest and refreshment, or to enjoy the prospect over the Bay of Marathon and the Attic plain, and they formed the background to some of the most stirring scenes portrayed in the annals of the world. But a few weeks ago a fire broke out on the heights and raged until the magnificent verdure of this famous forest was literally turned to ashes. A letter from Athens says that the mountain range now presents a pitiable picture of blackened devastation, with barren sides staring down on the field of Marathon. All of Attica above the capital is in mourning for the loss of this sylvan shade and shelter from the sweeping winds; and indeed the civilized world must lament the destruction of a forest intimately associated with so many capital events in the history of the Greek nation.

WE have heretofore given expression to the feeling of regret at the threat of extermination which hangs over some of our beautiful wild flowers, or at least at their certain disappearance from places where they have once abounded. It is unavoidable, where important changes are made in the face of the country by drainage or cutting away forests and by burning over clearings, that many indigenous plants will be destroyed. Where land is needed for agricultural use proprietors will not be careful to save *Trilliums* or *Lady's Slippers*, but it does seem cruel for collectors to gather so many of these plants to sell that they are practically eradicated from localities where they once bloomed in profusion. Other offenders in this respect are certain botanists who gather rare plants for specimens because they are rare. But the most serious attack of all comes from the thoughtless gatherers of flowers, who carry away wild flowers by the armful only to throw them away. We speak of this now because we have just received a descriptive pamphlet from the Secretary of the American Wild Flower Club, which contains an earnest appeal for the preservation of our native plants. We

cannot help feeling that a society of this kind might do much good if properly directed, and the formation of local clubs with the same purpose should be encouraged. It may be that the appeals of this pamphlet are fraught with a trifle more of urgency than the cause demands, but no enterprise of this sort will succeed without the enthusiasm and devotion which comes from a profound conviction of its importance on the part of its promoters. We have no personal knowledge of the working of this club, but all persons who have at heart the preservation of our native flora are invited to address the Secretary of the American Wild Flower Club, Wilmington, Delaware, if they desire more specific information as to its scope and aim.

A Stone Bridge in Wales.

WE give this week on page 479 a picture of another small stone bridge which, in conjunction with those already published, shows the variety in structure and general effect of which such rustic structures are capable. This one, which bears the name of Pont-y-pair, spans a little river at Bettws-y-Coed, in Wales, and, as will be seen, is of the simplest and roughest construction, but, nevertheless, is both stable and picturesque. From the aspect of the river-bed the photograph seems to have been taken at the dry season of the year. When the channel is fuller the look of the spot must be quite different and the sylvan beauty of the view much greater.

A Classification of American Grapes.

GENUS VITIS, Tourn.; L. (in part).

SECTION I. EUVITIS, Planchon.

- SERIES 1. RIPARIÆ (Munson).—1. *V. rupestris*, Scheele. Ozark Hills, Tennessee, to south-west Texas. 2. *V. riparia*, Michx. Rocky Mountains, to Atlantic, north of Ozark Hills, to 55° latitude. 3. *V. Solonis*, Hort. Berol. Headwaters of Red, Canadian and Arkansas Rivers. 4. *V. Doaniana*, Munson. Headwaters of Red, Canadian and Arkansas Rivers.
- SERIES 2. OCCIDENTALES (Munson).—5. *V. Arizona*, Engelm. Western Texas, New Mexico, Arizona, Chihuahua. *V. Arizona*, var. *glabra*, Munson. New Mexico, Arizona, Chihuahua, south Utah. 6. *V. Girdiana*, Munson. South of San Bernardino Mountains, California. 7. *V. Californica*, Benth. California north of San Bernardino Mountains to Rogue River, Oregon.
- SERIES 3. CORIACEÆ (Munson).—8. *V. Champini*, Planch. Cretaceous hills, south-west Texas. 9. *V. candicans*, Engelm. Cretaceous lands, Red River to Rio Grande and into Mexico. 10. *V. coriacea*, Shutt. Central and south Florida.
- SERIES 4. LABRUSCÆ (Planch).—11. *V. Labrusca*, L. Central Tennessee, north-east Georgia, east of Alleghanies to Maine.
- SERIES 5. ÆSTIVALES (Planch).—*V. vinifera*, L. Central and south-western Asia, early carried to Europe, etc. (exotic). *V. Bourquiniana*, Munson. "Southern Æstivalis" traced to southern Europe along the Mediterranean (exotic). 12. *V. Lincecumii*, Buckley. South central Texas. *V. Lincecumii*, var. *glauca*, Munson. North-eastern Texas to Missouri River. 13. *V. bicolor*, Leconte. Illinois, south Wisconsin, Michigan, Indiana, Kentucky, Ohio, New York. 14. *V. æstivalis*, Michx. Tennessee, Georgia, Alabama, North Carolina, South Carolina, Virginia, Indiana, etc. 15. *V. Simpsoni*, Munson. Central and south Florida.
- SERIES 6. CORDIFOLIÆ (Munson).—16. *V. cordifolia*, Michx. Brazos River, east to Atlantic, north to 42°. 17. *V. palmata*, Michx. Along streams, southern Illinois southward. 18. *V. monticola*, Buckley. Tops of cretaceous hills, south-western Texas.
- SERIES 7. CINERASCENTES (Planchon).—19. *V. Virginiana*, Munson. Mountain valleys, West Virginia. 20. *V. Berlandieri*, Planch. Cretaceous soils, south-west Texas. 21. *V. cinerea*, Engelm. Bottoms, south-west Texas, east to Atlantic, north to 40°. *V. cinerea*, var. *Floridana*, Munson. 22. *V. Caribæa*, D. C. West Indies and eastern Mexico, bottoms. 23. *V. Blancoii*, Munson. Sierra Madre Mountains, Guadalajara.

SECTION II. PUNCTICULOSIS, Munson.

- SERIES 8. MUSCADINIÆ (Munson).—24. *V. rotundifolia*, Michx. Southern States. 25. *V. Munsoniana*, J. H. Simpson. South Florida.

I offer the foregoing conspectus as my classification of American species of *Vitis*, and with it I send some estimate of the relative horticultural value of each.

Inasmuch as this classification does not entirely agree with others it may not be out of place to give some account of my preparation for the work. In the first place, I have taken the pains to visit each species, as far as possible, in its native habitat, to search out there the best plants in vigor and quality, to plant these together in a vineyard for comparison and study, to take notes of the distribution, altitude of locality, soil, habit and all botanical characteristics in every stage of the plant from the seed up to the fully developed vine, with critical notes and drawings at every stage and season. Besides this, I have hybridized nearly every species with one or many others and have noted the effects. Again, I have corresponded extensively with persons who have cultivated any of the native species either in pure or hybrid forms, and have obtained specimens of their best discoveries and hybrids, as well as botanical specimens from all quarters of North America, including Mexico and Jamaica. I have studied the leading herbaria in the United States which have important collections of the *Vitis* species, including the herbaria at Harvard, at the Academy of Science in Philadelphia, at Washington, and Engelm's collection at St. Louis. I have tried to study all the leading authors of the synonymy, although it is hopeless and inexplicable in many cases. I have attempted an exhaustive monograph upon the native Grapes of North America for the Department of Agriculture, which was written out first in 1887, and has been subsequently two or three times revised, and have been directing the work of an artist in painting accurately the growing shoots, full grown leaves, the flowers, male and fertile, etc., so as to give such complete illustration that even a novice may not err in the species when the work is finally published. My vineyard here contains growing specimens of every North American species of *Vitis* except *V. Californica* (which has been tried often, but as often perished by mildew) and *V. Caribæa*.

I have the species from Guadalajara, considered by Mr. Sereno Watson as *V. Caribæa*, and for a time considered by myself a variety of *V. Caribæa*, but now, after another season's growth, I am compelled to rank it a distinct species, as it develops specific characteristics not found in *V. Caribæa*. When I first obtained this in 1887 I thought it distinct, and had named it *V. Blancoii*, after Señor Luciano Blanco, of Guadalajara, who discovered it in the Sierra Madre Mountains. I shall hold to this name, as it appears now a good species, more clearly separated from *V. Caribæa* than is *V. cinerea* from *V. Berlandieri*, both recognized by our best Grape botanists.

There is not a species of the American Grapes which cannot by hybridizing and selecting be brought up to a fair degree of excellence as either table or wine fruit. One is astonished at the ameliorating effects of one cross in eliminating bad qualities and developing good ones. For example, a wild hybrid of *V. Labrusca* and *V. cordifolia* (the fruits of which are almost uneatable when pure), found growing in the woods in Roanoke County, Virginia, has produced seedlings which bear fine, large grapes, without pulp, foxiness or pungency.

V. rupestris has been used extensively, hybridized with *V. Lincecumii*, by H. Jaeger and myself, and with some other species less extensively, with the happiest results in producing very fine red wine grapes, and in some cases very good table grapes of pure, pleasant flavor.

V. riparia enters into many varieties in cultivation—in Taylor, Clinton, Montefiore, Elvira, Missouri Riesling and a host of others, combined with *V. Labrusca*—but too small of itself to be valuable. Some hybrids of *V. riparia*, from central Minnesota, with Concord, are about as large in berry and bunch as Champion, and earlier and better, and have endured unprotected a temperature of forty and fifty degrees below zero, and yet bore well. This species must enter into all varieties desired to endure the extreme winters of the north-west.

V. Solonis, with me, has been combined numerously with *V. Lincecumii*, *V. rupestris* and *V. riparia*, producing a peculiar class of grapes, without pulp and skins "thin as silk," juice always very highly colored violet and flavor very rich, sprightly, vinous, though often too acid.

V. Doaniana is generally a better grape in the wild state than Clinton and larger. It has great capacities in the hands of a skillful hybridizer, and will endure great heat and cold.

V. Arizona is the least promising of all the species for improvement in fruit, unless varieties specially adapted to the arid region of the southern Rocky Mountain region are desired. The quality is fine, but the fruit is very small, and the vine a feeble grower, even in this region.

I have one wild hybrid of *V. Girdiana*, with *V. vinifera*, which has clusters a foot long, and small to medium very sweet fruit. But it can hardly endure the mildew or cold of this region. This and *V. Californica* could be of no use east of the Rocky Mountains. They both are more tender every way than *V. vinifera*.

V. Champini produces a medium sized black grape often of fine vinous flavor, and has great vigor, hardness and constitution. For dry, hot regions, and limy soils, it offers a most excellent basis for a grand strain of varieties. It endures cold, too, to five to ten degrees below zero, but is affected somewhat by mildew in low, damp regions. *V. candicans* bears a horrible fruit for eating, owing to the biting pungency of the skin and the tough pulp, but the vine has great constitution for a hot country and limy soils. Though I have some fair hybrid Grapes with this, yet I think it time wasted to use it when we have so much better blood in other species. *V. coriacea* is a much more refined species, and some wild hybrids of this, with *V. Simpsoni*, from Florida, are quite good, but cuttings of *V. candicans*, *V. coriacea* and *V. Simpsoni* can be rooted only with the greatest difficulty.

Everybody knows the coarse *V. Labrusca*, which in its pure or hybrid varieties supplies almost the entire country east of the Rocky Mountains. It is a wonder that so good results have been obtained from this miserable "Skunk Grape." It is a pity that so much effort has been wasted on it while blood of quality so superior for every purpose can be commanded in other species.

V. Lincecumii, the large-fruited tribe of the *Æstivalian* series, has given some grand results in the careful hands of H. Jaeger and with me. It would take a fair sized catalogue to describe all the really good hybrids I have of this species, with *V. rupestris*, *V. Bourquiniana*, *V. Solonis*, *V. Labrusca*, *V. cinerea*, *V. cordifolia*, *V. vinifera*, etc. Suffice it to say that some of these, with grand vigorous vines that can endure twenty to twenty-five degrees below zero, have fruit that will stand critical tests with the best of *V. vinifera*. *V. bicolor* is capable, I am quite sure, of giving rise to a worthy tribe of pure varieties for Wisconsin, Michigan, etc., where it grows wild, as it is closely allied to *V. Lincecumii*.

V. æstivalis, another branch of the family, is already known to vineyardists in the Norton's Virginia, and with it there are quite a number of hybrids. I have several of these, some beautifully white and yellow, but not giving nearly such good results as my *V. Lincecumii* hybrids. *V. Simpsoni*, of south Florida, is the most peculiar member of this series, and is possessed of a much more tender pulp than *V. æstivalis*, and without the excessive astringency peculiar to the genuine *V. æstivalis*. But it is very sensitive to cold. It will probably become a valuable element in a race of hybrids peculiarly suited to Florida and the Gulf Coast. But its felty leaves are much attacked by leaf-rollers.

V. cordifolia, *V. palmata* and *V. monticola* have very smooth, glossy leaves never attacked by leaf-rollers, but the fruit is small and late and very seedy. However, *V. monticola* has a very sweet and peculiar flavor, and may yield something excellent in hybrids intelligently made. I have already mentioned some good hybrids with the unpromising *V. cordifolia*, or "Frost Grape."

V. Virginiana is a new species which I have obtained frequently from the high Appalachian valleys far down in Virginia. It appears to link the *Cordifoliae* series to the *Cinerascentes* in the east, as *V. Berlandieri* does in the far south-west. I had vines of this for seven years, not knowing where to put them in classification; till this year they have fruited, and prove to be different specifically from other species. The leaves are small, of a clear, lively green, somewhat pubescent, especially along the ribs; the young wood is angled as in *V. cinerea*, but becomes round and smooth at maturity, as in *V. cordifolia*. The clusters are very compound and compact, with very small berries of a dark purple color, covered with a thin bloom when ripe. The berries are very acid till quite ripe, then sprightly vinous. They ripen just before those of *V. cordifolia*, and two to three weeks earlier than those of *V. cinerea*. The seeds are very small, with scarcely any beak, cholera and raphe generally sunken, while in *V. cordifolia* and *V. cinerea* they are prominent. This species has never been published, so far as I am aware. *V. Berlandieri*, from the cretaceous soils of south-west Texas, is the species so much in demand just now in the chalky soils of France, especially in the Charente Inferieure, where no other species will grow without "chlorosing" (yellowing) from excess of lime; hence they use it there as a stock. But it has a very large cluster of rich, though remarkably small, fruit. It can easily be developed by hybridizing, as experiments have already proved. The leaves

are of a dark green, very glossy surface, so that the leaf-roller does not prey upon them. Its greatest difference from *V. cinerea* is in the dark green, glossy leaves, those of *V. cinerea* being wrinkled, dull green, pubescent and tomentose. The clusters and fruit are much alike. *V. Caribæa* has a rounder, broader leaf, with more rusty pubescence and tomentum than has *V. cinerea*, and the clusters are still larger, with smaller berries. It is too sensitive to cold to be of any service in this country. *V. Blancoii* has smaller, more cordate leaves than either of the three last-named species, and has the lower face densely tomentous, with snowy white wool and clusters nearly simple and much smaller than *V. cinerea* or *V. Caribæa*; but the berries are larger and of a different flavor, and the young wood is less angled. It can only be carried over winter here by careful protection, being much more tender than *V. vinifera*; but mildews do not damage it much.

V. rotundifolia is the common Muscadine of the south, and is much prized by old southerners, in such varieties as Scuppernong, Thomas, etc., which have three to nine berries in a cymose cluster. The berries are very large, with a very thick, tough skin and a large, tough pulp, and have a peculiar musky flavor. They are of a dull, rusty yellow in Scuppernong, or dull black in others. The seeds are very large, resembling Coffee-grains. Some hybrids have been produced, but are not promising. The species is remarkably free from all manner of diseases and insect attacks.

V. Munsoniana is of a very slender, weeping habit, leaves smaller, with fewer, larger teeth than in *V. rotundifolia*. It begins to bloom later and continues to bloom on till frost. The clusters are of the cymose character, but bear from ten to twenty or more berries, which are small, with shining black skin, rather thin, pulp melting, filled with acid juice without the rustiness of Muscadines. The seeds are very small. This species is fully as distinct from *V. rotundifolia* as is *V. rupestris* from *V. riparia*, or *V. cinerea* from *V. Caribæa*, if not more so, and, to be consistent, it should be recognized. It appears somewhat more nearly related to the true "bunch-grape" than *V. rotundifolia*, and may be valuable to hybridize for the south.

For beautiful effect as ornamental vines in bowers running over arbors and the like, *V. palmata*, *V. monticola* and *V. Munsoniana* are exquisitely delicate, graceful and beautiful. *V. palmata* is hardy in central Illinois, *V. monticola* will endure nearly as much, *V. Munsoniana* will live almost anywhere in the southern states.

Dennison, Texas.

T. V. Munson.

Drought-enduring Trees.

WE have had in central Iowa during the past summer the culmination of a three-year shortage in rainfall. At the commencement of spring growth we were over forty inches short of the normal supply during the three years past, and up to the first of September our lawns have had the aspect of California during the dry season. Under these circumstances I wish to note some not well known trees and shrubs which have endured our recent test winters perfectly, and have made fine, luxuriant growth during the drought where most native trees and shrubs have hardly held their own.

CUT-LEAVED BIRCH.—Our trees are from Moscow, where this tree has been long grown, and where it possibly originated from the pendent, small leaved species from the Amur Valley (*Betula Amurensis*). Our specimens have been models of health, and have made rapid growth without apparent regard to scanty rainfall. As this has also been true over the state with specimens propagated from the west European stock, I suspect it was originally obtained from east Europe.

BETULA ALBA VERRUCOSA.—Plants from east Europe of this fine variety were planted eight years ago in blue grass sod on the campus. They are now handsome, erect trees, from thirty to thirty-five feet in height. While the native Elms by their side show little recent growth and dead branches, these Birches have been growing like Russian Poplars and Willows.

ELÆAGNUS ANGUSTIFOLIA.—This beautiful silver-leaved tree of the east has also made luxuriant growth. When loaded with flowers its fragrance has been noted at a distance of over forty rods.

ALNUS RUGOSA.—A dry climate species that appears to delight in a dry air and dry soil. In expression it is a better tree than the Scotch Alder, which does not endure such summers on dry soil.

ULMUS EFFUSA.—This species is much planted to arrest snow sweeps along the Russian railways. It has large, handsome leaves, a dense habit, and is by all odds the handsomest Elm we have. It has made luxuriant growth when our natives have suffered severely from drought.

PYRUS ARIA LACINIATA.—The White Beam of west Europe has not endured our recent summers or winters. But this eastern variety has been perfect, a rapid grower, and its beauty of foliage has attracted much attention.

VOLGA OAK.—I picked up some acorns under a beautiful Oak on the bluffs of the upper Volga in 1882. Trees from these, twice transplanted, are now twelve to fourteen feet in height, with dark green cut leaves of great beauty. In rapidity of growth during our dry period they have been a thing of wonder. It is said to be a variety of *Quercus robur*; but it is peculiar in expression, and the acorns are borne on thin, tough peduncles from three to four inches in length.

PHELLODENDRON AMURENSIS.—The Phellodendron from China and Japan is as tender here as the common Peach. But this species as obtained from Russia appears to be hardy, handsome and defiant of drought.

PYRUS TORINGO.—A species of the Apple from east Europe with remarkable, thick, rugose leaves that hold their color until very late in the fall. Severe early freezing does not appear to affect the health or color of the handsome foliage. It is a beautiful, round-topped tree, with pretty flowers and long stemmed fruit. It is said to be the original form of some of the Transylvanian Apples.

SALIX LAURIFOLIA.—As introduced from east Europe, this does not appear to be identical with that of the eastern nurseries. It is a handsome, round-topped tree that few recognize as a Willow until the buds and twigs are examined. It appears to delight in heat and aridity of soil and air.

ACER GINNALA.—This makes a pretty, small tree in our climate, which in the fall puts on all the gorgeous colors of the Japan Maples, which will not live with us.

RHUS COTINUS.—As introduced from the eastern nurseries the Venetian Sumac will not endure our winters. But the variety from extreme east Europe is perfect.

Iowa Agricultural College.

J. L. Budd.

New or Little Known Plants.

Rosa Watsoniana.

THIS curious Rose, of which a figure appears on page 477 of this issue, has been grown in the Arnold Arboretum during the last dozen years. It came to the Arboretum from the garden of Mr. Edward S. Rand, in Dedham, Massachusetts, who had obtained it, if I remember rightly, from a garden in Albany, New York. It was supposed to have been brought from Japan and to be a cultivated form of a variety of *Rosa multiflora*. Its Japanese or Chinese origin is probable, but Monsieur Crépin, whose knowledge of roses is unrivaled and to whom specimens from the Arboretum have been submitted, points out certain characters which separate it from that species and from another east Asia species of the same section (*Synstylæ*), *R. anemonæ-flora*, to which, however, it is closely related. The fact that the plants although perfectly hardy and flowering profusely every year produce no seed, would seem to suggest some long cultivated abnormal form from a Japanese garden, a view which is further strengthened by the fact that wild specimens of this plant have not been collected.

*Rosa Watsoniana** is a graceful plant with slender semi-prostrate stems armed with slender recurved spines. The leaves are three or sometimes five-foliolate with pubescent glandular petioles armed with minute recurved spines, and with very narrow, adnate, entire, hairy stipules. The leaflets are narrowly lanceolate or linear, contracted at the two ends and at the apex into a long slender point; they are pubescent on the lower surface along the midrib, entire, with sinuate wavy margins, and are two or two and a half inches long, the broadest less than a quarter of an inch wide. The inflorescence is many-flowered, pyramidal, four or five inches long, three or four inches broad, the primary bracts awl-shaped, hairy, deciduous with the opening of the flowers. The slender pedicels are jointed and provided with minute membranaceous, caducous bracts. The flower-buds are ovoid and slightly hairy. The sepals are narrowly lanceolate, entire, subulate-pointed, and covered thickly on the inner surface with dense pubes-

cence. The petals, which are obovate, pointed at the apex, entire, pale rose-colored, form a corolla less than half an inch across when the flower is fully opened. The column of united styles is slender, elongated, and glabrous. The flowers open about the middle of June.

Rosa Watsoniana possesses considerable interest as a curiosity among Roses, but little beauty or value as a garden plant from the ordinary horticultural point of view; and it will probably never be very much grown, either for its remarkable foliage or its minute flowers. It has proved, however, an admirable stock for several of the Hybrid Perpetual Roses, and has already been propagated to a considerable extent for this purpose in the neighborhood of Boston.

Our illustration is from a specimen grown in the Arboretum.
C. S. S.

New Orchids.

EPIDENDRUM VITELLINUM FLORE PLENO.—A very interesting case of doubling has occurred in the well known *Epidendrum vitellinum*. A plant in the collection of Mr. Raphael, of Castle Hill, Englefield Green, recently produced five racemes, every flower of which was double and quite regular. The lip was replaced by an ordinary petal, and the column was broken up into six small petal-like segments, which occupied the centre of the flower, thus producing a perfectly regular double flower of twelve segments. Whether the peculiarity will prove permanent remains uncertain.—*Gardeners' Chronicle*, July 26th, p. 103; August 2d, p. 123.

MASDEVALLIA COSTARICENSIS, Rolfe.—A pretty little Masdevallia, introduced from Costa Rica by Messrs. F. Sander & Co., of St. Albans. It is allied to *M. Reichenbachiana* and *M. marginella*, especially to the latter, as the flowers are much of the same color, being white with yellow tails, and the nerves of the lateral sepals of the same color. The peduncle bears two or three flowers in succession.—*Gardeners' Chronicle*, August 16th, p. 183.

CYPRIPEDIUM × YOUNGIANUM, Rolfe.—This handsome hybrid, mentioned on page 428, is fully described in *Gardeners' Chronicle* for August 16th, p. 183.

MASDEVALLIA LOWII, Rolfe.—This distinct and pretty species of the Saccolabiata section, mentioned at page 133, was awarded a first-class Certificate by the Royal Horticultural Society on August 12th.—*Gardeners' Chronicle*, August 16th, p. 197.

MASDEVALLIA × AMESIANA.—A hybrid raised between *Masdevallia Veitchii* and *M. towarensis*, and exhibited by Messrs. F. Sander & Co., of St. Albans, at a meeting of the Royal Horticultural Society on August 12th. The flowers are described as apricot-colored.—*Gardeners' Chronicle*, August 16th, p. 197.

PHALÆNOPSIS MICHOLITEZII.—A new Phalænopsis, somewhat allied to *P. tetraspis*, which was exhibited by Messrs. F. Sander & Co. at a meeting of the Royal Horticultural Society on August 12th, when a Botanical Certificate was awarded it. The flowers are greenish white, the lip white with coarse hairs and a yellow crest, and the leaves ovate, shining green and about seven inches in length.—*Gardeners' Chronicle*, August 16th, p. 197.

CYPRIPEDIUM × H. BALLANTINE.—A hybrid between *Cypripedium purpuratum* and *C. Fairieanum*, exhibited by Messrs. James Veitch & Sons, of Chelsea, at a meeting of the Royal Horticultural Society on August 12th, and to which a first-class Certificate was awarded. It is of dwarf habit, with much of the reticulations of *C. purpuratum* on the dorsal sepal, the petals greenish brown, with lines of crimson and the lip of similar coloring.—*Gardeners' Chronicle*, August 16th, p. 197.

CORYANTHES BUNGEROTHII, Rolfe.—A very fine species of Coryanthes, rivaling *C. Fieldingii*, whose flower Dr. Lindley affirmed to be the largest yet known among Orchids. It was sent from Venezuela in 1888 by M. Bungeoth to Messrs. Linden, L'Horticulture Internationale, Brussels, in which establishment it flowered in May of the present year. It is one of the most remarkable Orchids in existence, both in the structure of the flower and in the economy of fertilization. It is described and finely figured in *Lindenia*, vol. vi., t. 244; also described in *Gardeners' Chronicle*, August 23d, p. 210.

DENDROBIUM GALLICEANUM, Linden.—A very beautiful Orchid with the habit of *D. thysiflorum*, to which it is obviously allied. The sepals and petals are white, and the lip canary yellow, with fimbriate margin. It was imported with *D. thysiflorum* by Messrs. Linden, L'Horticulture Internationale, Brussels.—*Lindenia*, vol. vi., t. 241. R. A. Rolfe.

*Crépin, *Bull. Bot. Soc. Belg.*, xxvii, part 2, 98; *Jour. Royal Hort. Soc., London*, xi, part 3, 2. *Revue d'Horticulture Belge et Étrangère*, xiv, 183, f. 16.

Foreign Correspondence.

London Letter.

LAST Tuesday an opportunity was afforded to horticulturists interested in the subject to compare the two garden races of Gladioli, known by the names of the Gandavensis and the Nanceianus races. This last is of only recent origin,

dict with respect to the merits of the two races of Gladioli as represented by the flowers exhibited was that whilst the Nanceianus varieties were first in interest, they fell a long way behind the Gandavensis race in point of form, size and richness of color in the flowers.

It would be difficult to find in the whole range of the great Irid order any flowers equal in richness and beauty to such Gladioli as Leonard Kelway, Mont Blanc, Baroness Burdet



Fig. 59.—*Rosa Watsoniana*.—See page 476.

having been raised by Monsieur Lemoine, of Nancy, and distributed last year. The Royal Horticultural Society had invited Monsieur Lemoine and Mr. Kelway, the famous grower of the Gandavensis race, to read papers on, and make an exhibition of, these two races of Gladioli. The result was a most interesting and edifying exhibition of beautiful flowers, and the production of two papers of the greatest value and importance to cultivators of the Gladiolus. The general ver-

Coutts, Baron Schroeder or even than Gandavensis itself. Spikes as thick as a man's thumb, bearing about two feet of flowers, of which twelve or more are open at the same time, are common with Gladiolus growers now. Twenty years ago the spikes of the best kinds were not nearly so stout, and four or six flowers open at once were considered good. Mr. Kelway, Messrs. Burrell & Sons, of Cambridge, and one or two other growers are to be thanked for the great improvement

made not only in the size and color of the flowers, but also in the vigor of constitution which characterizes many of the newer kinds.

Mr. Kelway stated that he had grown and bred Gladioli for nearly sixty years, but it was not until 1857 that he took up their cultivation and improvement in earnest. His cultural directions were simple: a light, deep soil, the ground to be roughly dug and manured in October and allowed to remain thus till February, when the manure should be turned in and the corms planted about three inches deep, eight inches apart in the row and eighteen inches between each row. They should be lifted soon after the flowers fade and before the leaves turn yellow. They are less satisfactory if allowed to remain in the ground longer than this. They should be dried in the sun and afterward stored in a dry, cool room or shed for the winter.

By selecting the kinds and planting the bulbs in succession Mr. Kelway has these plants in flower from July till November. For decorative purposes the flowers are of great value. A large vase filled with the huge spikes of bright colored flowers is a delightful picture, and the flowers remain good for a fortnight or more. Mr. Kelway's exhibits of Gladioli at the London and provincial shows invariably open people's eyes. Yet the plants are not much grown, notwithstanding the small amount of trouble they give. Most inexperienced growers here fail with Gladioli through mistakes in harvesting and storing the bulbs.

The Nanceianus varieties possess the useful characters of hardiness and a preference for remaining in the ground undisturbed from year to year. A celebrated grower stated at the meeting that he had had some of Lemoine's hybrids (Lemoinei) undisturbed in the ground from six to eight years, and that where one bulb was at the time of planting there is a large clump now. Unquestionably we have in them the foundation of a most valuable race of garden plants. They are only beginnings as yet, but unless they differ in this respect from the Gandavensis varieties a few more years will work a great improvement. The history of his hybrid Gladioli, as told by Monsieur Lemoine himself, is most interesting. He started in 1875 with *G. purpureo-auratus*, a species brought from Natal to England in 1870. This has a spike two to three feet high, arched above, the flowers small, cupped, and colored dull yellow, with a blotch of purple on the lower segment. It proved perfectly hardy in England, and increased rapidly if left in the ground. Lemoine crossed it with the hybrid *G. Gandavensis*, which had been raised from *G. psittacinus* and *G. cardinalis*. From this cross he obtained Victor Lemoine and Marie Lemoine, the former with salmon-pink, the latter cream-yellow flowers. These obtained first-class certificates, and were distributed in 1880. The largeness of flower and number on a spike of Gandavensis had yet to be infused into the new race, so the first hybrids were crossed with it again, and every year about ten new varieties were thus obtained, until altogether sixty of them, distinct in form and color, and showing considerable variety in both these characters, had been named and distributed. The consanguinity of the whole of these was always apparent, the cupped flower, and a dark blotch surrounded by a clear space of yellow on the lower segment, being characteristic of them all. Colors of every shade, from yellow to purple, and blended in the most remarkable manner, had been the outcome of crossing a dull yellow-flowered species with the scarlet-flowered *G. Gandavensis*. So far the hybrids are known as *G. Lemoinei*. Then M. Lemoine began with *G. Saundersii*, introduced from the Cape, and flowered for the first time at Kew in 1877. It is figured in the *Botanical Magazine*, t. 5873. This species is remarkable for its short, curved, somewhat slender spike, bearing a few large flowers which have reflexed segments, and colored pale scarlet, white and pink. It is quite as hardy as *G. purpureo-auratus*. In 1882 Max Leichtlin crossed *G. Gandavensis* with *G. Saundersii*, which resulted in seedlings with stout spikes, large open flowers, fully four inches across, and showing considerable variety of color. These are supposed to have been secured by an American nurseryman, and it is possible that they or their progeny are the fine seedlings from Messrs. Hallock & Son, noted by me a week or two ago as being in flower at Kew.

Monsieur Lemoine crossed *G. Saundersii* with some of the best of the varieties of *G. Lemoinei* in 1883. When *G. Saundersii* was the seed-parent very few seeds were obtained, and from them came the two large-flowered, richly colored seedlings known as President Carnot and Maurice de Vilmorin. When one of the seedlings of *G. Lemoinei* was pollinated from *G. Saundersii* there were plenty of seeds. Thus the new race known as Nanceianus was originated, and in 1889 nine of the seedlings were named and distributed, whilst a large number of seed-

lings have not yet been sent out. The king of the lot is that called President Carnot. Its spikes are six feet high, the flowers seven inches across, the segments spreading and open, whilst the color is cherry-red, striped with carmine, the lower segment having a large scarlet blotch surrounded by a band of white.

Monsieur Lemoine claims for his new seedlings a hardier and better constitution than that of *L. Gandavensis*. They thrive in almost any kind of soil and do not require lifting in autumn; they are not influenced by unfavorable seasons to the same extent as *L. Gandavensis*. They bear and invite close inspection; the more one examines them the more beautiful they appear, and they show a wonderful range of color.

Of the seedlings shown by Monsieur Lemoine the following were the most noteworthy:

BAUDIN, flowers large, scarlet, with a yellow blotch and crimson throat.

M. DE VILMORIN, purplish lavender, flaked with brick red and yellow.

NEUE BLEUE, flowers deep violet, blackish purple in the throat; they were one and a half inches across. This was the most striking novelty exhibited, being almost blue in color.

E. V. HALLOCK, flowers large and open, colored cream-yellow, with a blotch of rich maroon on the lower segment.

CROZY FILS, bright crimson, white toward the base and lined with white.

M. LEFEBVRE, large flowers, colored raspberry red, speckled with crimson and blotched with white.

ALICE WILSON, bluish white, flaked and blotched with crimson; a very good variety.

MASQUE DE FER, flowers small, the four outer segments colored blood crimson, the inner pair smaller and deeper in color.

PACTOLE, sulphur yellow, darker in the throat, with a crimson blotch.

It may be said of these seedlings originated by Monsieur Lemoine that their most striking feature is the richness and extraordinary shades of color they show, and he is to be congratulated on what he has accomplished with this race of plants in so short a time.

London.

W. Watson.

Cultural Department.

Bulbs for the Greenhouse.

Scilla Clusii, now offered in quantity, is a really desirable winter-flowering bulb. We have cultivated it for the past three years, and have found that the bulbs may be had in flower from Christmas onward by starting them in succession. *S. Clusii* is, I believe, a native of Algeria, and, like all bulbs from that region, is not hardy, but succeeds well in an ordinary greenhouse or with window culture. A good-sized flowering bulb will need a six-inch pot and an abundance of water when about to flower. *S. Clusii* seeds freely, and, what is of more importance, the seeds germinate readily and make strong flowering bulbs the second or third year if treated liberally.

S. Peruviana resembles the above in many respects, except that it is a giant by comparison. This is not a South American plant at all, but is a native of south Europe. It is generally hardy in English gardens, but not so here in the eastern states, though it is a pity, for the immense pyramidal heads of bright blue flowers are very ornamental together with the thick, broad green leaves, which form a fine setting for the spike of flowers. *S. Peruviana*, however, has one fault that may tell against it in the opinion of many cultivators—that is, it never flowers two years in succession; it seems to need a whole year's rest after the effort of producing its large spike of flowers.

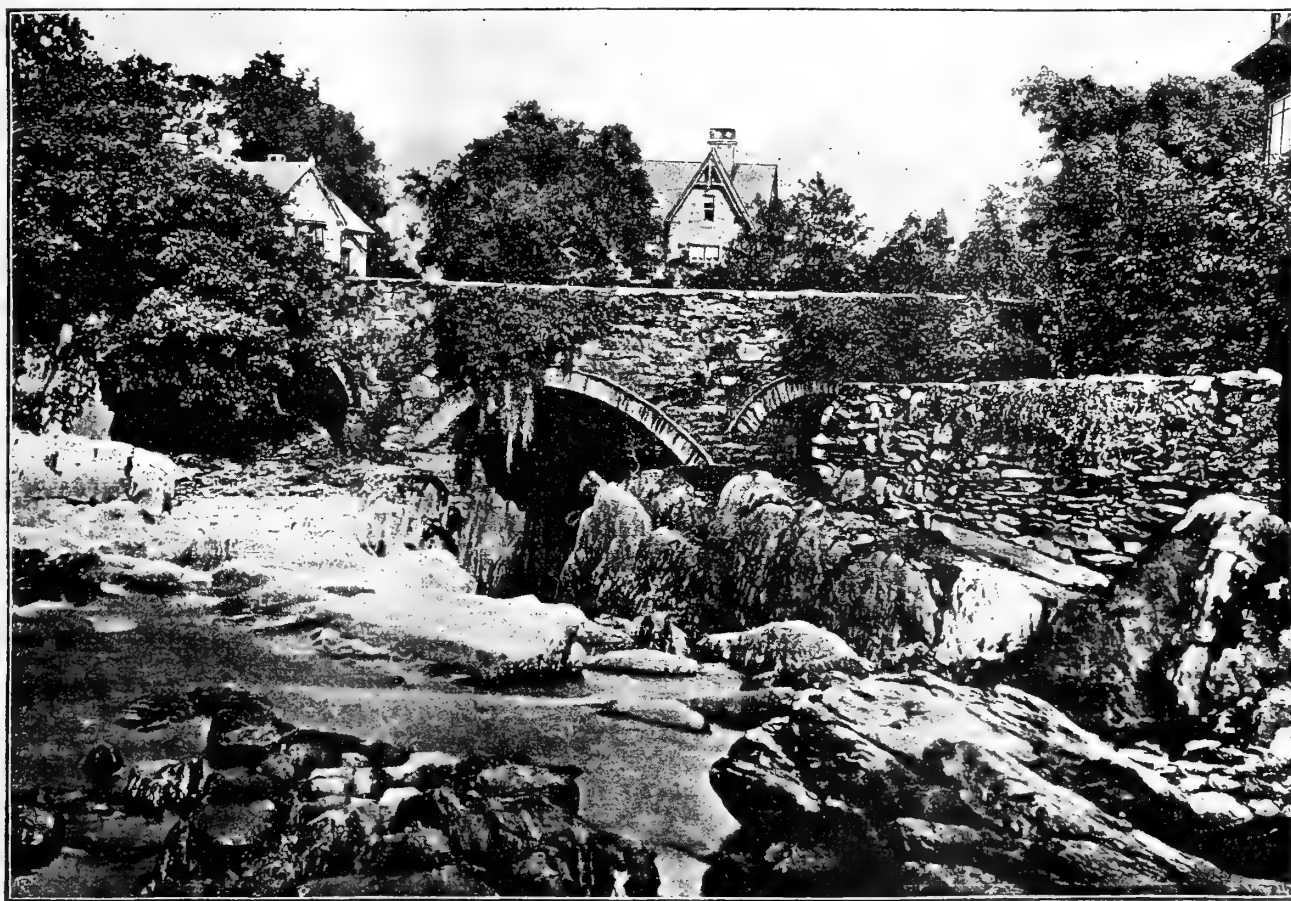
Ornithogalum Arabicum is another bulb which we have grown for several years, and which has been recently distributed in quantity. When one can get this plant in flower, it is the best of the genus. The flowers are large, pure white, with a dark olive-green centre, usually described as black. This plant has the same fault as that of the *Scilla* above referred to—it is impossible to flower it annually. We have grown some thirty bulbs, and every second year all that were large enough produced fine spikes of flowers, and just as surely did we never get a flower the year after. This is the more remarkable as the bulbs, many of them, were the offsets formed from the older bulbs and grown on. Had they been all of the same age or obtained at the same time it would not be surprising; but it appears that, under cultivation at least, it is the nature of the plant to abstain from flowering every second

year, and therefore those who have *O. Arabicum* should not throw it away because it did not flower last year, or if it did and fails to do so this coming season. All who know it will be perfectly willing to wait until the second year, for the plant has a distinct beauty peculiarly its own. These bulbs should all be potted in rich soil with good drainage and plenty of water when the flower stems appear. In all three of the plants named the leaves appear too weak to bear their own weight; they fall down over the pots and split in the centre if not supported by a cord tied to stakes around the edge of the pots or in some other way. There are white forms of both *Scilla Clusii* and *S. Peruviana*, but in each case the typical blue is the most desirable.

Last year I spoke of the value of *Oxalis Bowiei* for pot culture, and many inquiries were received at the time as to where the plant could be obtained and when to plant it. This is the best time to pot the bulbs, and they will start to grow at once and flower until Christmas. There seems to be a general waking up to the value of this *Oxalis*, which is the showiest and best of a genus that contains some 200 species.

The so-called *K. australis* is not now recognized as a species by some of the leading botanists, who claim that it is merely a form of *K. Belmoreana*, though it is still catalogued by some European growers as *K. australis*. The Kentias have become very popular of late years, and are now grown by thousands in the larger nurseries throughout the Atlantic states, while the seeds are imported direct and by the bushel. The Palm-seed trade, by the way, has attained large proportions now, but the limit will probably be reached in a few years, as the number of seed-growers appears to be increasing more rapidly than the demand, large as this has been.

Geonoma gracilis is a very pretty little Palm and useful for occasional decorations, though for lasting qualities under adverse conditions it is not to be compared with *Cocos Weddelliana*, which has much tougher foliage, and is therefore much more extensively used on this side of the ocean. To be kept in good condition *G. gracilis* should be well shaded, but at the same time free ventilation is necessary, else the foliage will be too soft. The same rule, as to shade, applies to all the *Geonomas*, because in their natural condition they are usually



A Stone Bridge in Wales.—See page 475.

There is a good colored plate of this plant in the London *Garden* of May 31st of this year, under the name of *O. Bowiciana*. In England this plant is used for summer flowering, but the bulbs are usually shipped to this country in fall with other bulbs from Holland, and make equally good winter pot-plants. The foliage resembles gigantic Shamrocks, and the flowers are one and a half inches across and of a bright rose color. *O. Bowiei* is well adapted to window culture, and multiplies rapidly by means of its bulbs.

South Lancaster, Mass.

E. O. O.

Palm Notes.

PROMINENT among the Palms for conservatories, and useful as well for house decoration, are the Kentias, the varieties most in use being *K. Forsteriana*, *K. Belmoreana* and *K. Canterburyana*, all of which are decorative plants of the first grade. These Palms all succeed admirably under cool-house treatment, although the first two sorts mentioned are used in much larger quantities than *K. Canterburyana*, the latter being a much slower grower, and, consequently, not nearly so profitable a plant to commercial growers.

found growing beneath the shade of other and larger growing Palms, and seldom or never out in the open.

Some of the "Fish-tail Palms" or *Caryotas* are very useful and highly ornamental as small and medium sized plants, though they rapidly attain such proportions, when under suitable treatment, that they are not suited for all collections. Of the *Caryotas* the most common and easiest to procure are *C. urens* and *C. sobolifera*, both of which are good and also easy to manage, as they germinate from seed readily and in a short time and make rapid growth.

Caryota urens throws up its handsome leaves on strong stems, and in a large plant they sometimes reach a length of twelve feet or more. The leaves are bipinnate, which is an unusual characteristic among Palms, and the pinnules are more or less wedge-shaped, being from six to eight inches in length and about half that measurement in width. The ends of the pinnules are erose, this giving them an odd appearance and readily suggesting the common appellation of "Fish-tail Palm," while the color of the leaf is dark green. Another peculiarity of *C. urens* is the manner in which it flowers, though this process does not begin until the plant has attained its full size. It begins to flower from the centre at the top of the

stem, after which the flower-spikes are produced in succession downward nearly to the base of the trunk, until the vitality of the plant is exhausted. The seeds are somewhat larger than a Bush Bean, dark brown in color and quite hard, this description applying to the seed proper after the outer fleshy rind has been removed.

C. sobolifera is also a fine plant, and is more dwarf in growth than the preceding. It also has bipinnate leaves, which are bright green in color, and as it throws up suckers at the base of the plant it naturally has a more bushy habit than *C. urens*. Other good representatives of this genus are *C. furfuracea* and *C. Rumphiana*, both of which are good decorative Palms. *Acanthorrhiza stauracantha*, sometimes known as *Chamærops stauracantha*, is another fine Palm which will succeed in a moderate temperature. It has palmate leaves, deeply divided, and dark green above, while the under side is covered with a silvery tomentum. A distinguishing feature of this plant is the mass of root-like spines which surround its base, and from which its generic name is derived. It is a native of Mexico, and though not yet very common, has been in cultivation for many years.

A few Sabals prove very useful in a collection of plants, as they will endure much hard usage with but little apparent injury, their deeply divided, flabelliform leaves being of very strong texture, so that they stand well when bedded out in the summer. *S. Adansonii*, which is found in some of the southern states, and *S. Blackburniana*, a native of the West Indies, are among the best and most serviceable.

Holmesburg, Pa.

W. H. Taplin.

The Water-Garden.

NYMPHÆAS and other flowers are still blooming in the tank, but cool nights are checking rampant growth, and the frost will soon close an aquatic season which has been full of interest. The plants under culture have usually grown freely, though there are some failures which are rather puzzling. Sometimes, for instance, a Nymphæa, in apparent good health and well planted, has remained stationary for weeks, and then shot suddenly into vigor. Again, one would like to know to what extent the coloring of the flowers is affected by the manure used, as this would seem to be so affected in the case of the pink Lilies. In my small tank it is necessary to restrain the plants somewhat by contracting the root-room, the disadvantage of which is that the gross feeders use up the nutriment very effectually before the end of the season. Perhaps the addition of bones in a rather coarse shape or some other slowly decomposing fertilizer would prove a useful addition to the barnyard manure usually recommended? Of course, the plants are generally inaccessible, so that necessary stimulants cannot be applied at will.

There is often a question as to whether a small tank does not become stagnant, but with vigorous vegetation and a supply of fish there should be no trouble on this score, though a water-garden is no more automatic than any other and requires a certain amount of intelligent attention. Since the settlement of the manure early in the season the water has remained perfectly clear, and while, perhaps, not potable, it has been free from low forms of vegetation and has bred no mosquitoes; though the fish, finding nice spawning grounds in the sand, have multiplied exceedingly and added abounding life to the water. Ordinary gold fish are hardy and attractive, but a few Chinese Fantails must give a new interest to this department another season. Of the white Nymphæas, *N. alba candidissima* has proved the sturdiest grower and most persistent bloomer. The flower is larger than that of *N. odorata*, though without its fragrance. *N. pygmæa alba*, the little Chinese hardy variety, is also still in bloom, with no sign of going to rest. This Water Lily is rather inconspicuous in a pond, but very pretty in a small tank, in-doors or out.

Of the colored Nymphæas, *N. Devoniensis*, with its noble deep rose colored flowers and rich wine colored leaves, is probably the most beautiful, and, though blooming at night, it should be in every collection. Another tender kind and a more free bloomer is *N. Zanzibarensis*, which has bloomed continuously since early summer. Its large purple flowers, borne well above the water, are very attractive. The red variety is plentiful, though some stir seems to have been made over one of this color said to have been raised in Germany this year. Seedlings of the Zanzibar Water Lily are rather inclined to sport through shades of red and purple, though the dark purple is a somewhat scarce plant. Cape Cod Lilies, in a rich compost, were very highly colored during an altogether too short season.

The French *N. rosacea* seems to be different from this

only in having a much more delicate pink tint. *N. chromatella* has shown numerous large flowers of a rich yellow tint, with deeper colored stamens. This bears the largest flowers of any yellow variety, some blooms nearly approaching those of *N. candidissima* in size. The leaves are very distinct, being blotched above and thickly spotted below with red. *N. sulfurea*, another of Marliac's hardy Lilies, was even more brightly spotted, but has yet not flowered. *N. Mexicana*, for which I am indebted to Mr. Horsford, also refused to move for me, but, as shown by Mr. Wm. Tricker, is a smaller flower than *N. chromatella*, though of a fine yellow. As it has a slightly mottled leaf and the habit of *N. flava*—of throwing out runners—it is probably near akin to that variety, if not identical. It is to be hoped that collectors and fanciers will search carefully for fine or distinct forms of our native Nymphæas, for no doubt, with care, such may be found.

No collection of aquatics is complete without *Nelumbium speciosum*, for the introduction of which we owe a great debt to Mr. Sturtevant. Of this one does not know whether to admire most the noble flowers or the wonderful, beautiful leaves. It is a plant of vigorous growth, and needs restraint, or its runners will quickly fill a large space. It is still throwing up its flower-buds. But for vigorous growing aquatics commend me to *Eichhornia (Pontederia) crassipes* (South American Pond-weed). The note in GARDEN AND FOREST as to this growing in acre plots was no "traveler's tale," as it will rapidly fill all available space. It will increase about 500 per cent. under ordinary culture, and whether planted in the ground or floating in water it is a vegetable wonder with beautiful flowers. *Limncharis Humboldtii*, with its fine yellow flowers, of course, is ever attractive. Two neat little floaters are Azolla, with small oval leaves, and *Salvinia natans*, a little Selaginella-like plant of rapid increase.

Of the Sagittarias, *S. Japonica* has the finest flowers, in racemes of pure white, very double and Balsam-like. *S. Montevidensis* is the strongest grower of the race, with broad, deep green, tall foliage, and large, white, single flowers, with a crimson spot at base of each petal. Not the least attractive and satisfactory plant is *Cyperus Antiquorum*, always exciting attention by its distinctness, and of sturdy, vigorous habit. The Swamp Plantain (*Alisma Plantago*) is an attractive and showy plant, with its large, loose raceme of small white flowers. It seems to be beloved of aphides, which, however, soon disappear if the plants are sprayed or syringed with pure water forcibly enough to wash them off, when the fish quickly dispose of them.

Elizabeth, N. J.

J. N. Gerard.

Bulbs from the Pacific Coast.

MANY of the species of *Calochortus* and *Brodiaea* from the Pacific Coast, especially those from California, are somewhat difficult to manage in our cold eastern climate. The ocean currents of that coast have such an influence on the climate that even in the northern portions of Washington along the coast the winters are quite mild as compared with the same season farther east. Some of these bulbs when wintered in an ordinary cellar begin to grow about the last of February, and by the time the ground is ready for them in spring this early growth has so exhausted them that they have little vigor left. They are not hardy, and if planted in autumn without protection will not survive our severe winters. Perhaps a very cool cellar might prevent this winter growth, but I question it. The only way I have been able to flower many of them has been to plant early in autumn and protect with three or four inches of leaves. If planted before the weather is too cold they become well rooted before winter. I believe that most of them will bear some freezing, and it seems to me that it is the alternate thawing and freezing of plants that winter kills so many. If they can be kept from thawing before spring after they have once been frozen, the cold is not so injurious. By covering them with three or four inches of leaves, though not enough to keep out all frost, they will remain frozen and dormant until it is time to remove the covering in spring.

Mexican bulbs are quite different in their manner of growth, and may be wintered in a cellar with perfect success. They will not usually start to grow before the last of May or first of June, even if planted as early as the ground can be prepared in spring. The Fritillaries from California and Oregon have done much better planted in autumn and treated in this way; and the Lilies, though much more hardy than the other bulbs, seem to do better when covered. No doubt deep planting may answer for some of them, but if the soil is of the right kind I would prefer to plant five or six inches deep, with a light covering, to eight or ten inches.

Most early-flowering plants, if not all of them, should be planted early the previous autumn. August, or July even, is not too early for some of them. The Dog's-tooth Violets, Chionodoxas, Spring Beauties, Trilliums, etc., are never as strong the first season when planted in spring or late autumn as when set in August and September. They do not flower so early nor last so long.

The Lilies from the Pacific coast are most of them early bloomers, and should be planted in early autumn. We have seldom succeeded in flowering *L. Washingtonianum* or *L. Humboldtii* when planted in spring, and they seem to require more time to become established than most plants. *L. pardalinum* has been the hardiest species. In a light loamy soil *L. parvum* and *L. rubescens* do finely, but in clay or clay loam they refuse to thrive. *L. Parryi* is a more southern species, yet it seems hardy with deep planting, and is not hard to grow. Its beautiful canary-yellow flowers appear with those of the earlier flowering sorts. It needs more moisture, however, than the other species.

Southwick, Mass.

F. H. Horsford.

The Celery Blight.

THIS season has been particularly favorable for the development of the leaf-blight of the Celery. In a recent ride through portions of Mercer County, New Jersey, gardens were found where the Celery crop was practically a failure—the plants almost from the time they were set in the benches having suffered from the blight. This unfortunate state of the plants is due primarily to a parasitic Fungus called *Cercospora Apii*, that infests the Celery and some allied plants, the Carrot often suffering considerably from the same disease.

The presence of the blight is evidenced by yellowish green irregular patches upon the foliage. These spots shortly turn to a brown color, and finally the entire leaf, in the worst cases, droops, dries up and dies. If one of the diseased patches was examined under the microscope it would be found that small brown tufts of minute filaments protruded from nearly every one of the thousands of breathing pores in each square inch of the epidermis. Upon the tips of the threads constituting the tuft are borne long, slender spores, which fall away when ripe, and are carried about by the winds when dry and by the rains during wet weather. As the feeding threads of the Fungus are throughout the substance of the infested plant before they come to the surface to bear their spores, it is useless to try and effect a cure of foliage already badly infested.

The most natural thing to do is to pick off the worse than worthless leaves and burn them. This will do something to hold the trouble in check. In the second place, some substance can be placed upon the diseased parts to kill the spores, and at the same time upon the healthy plants or parts of plants to prevent the germination of the spores that may lodge there. From the nature of the trouble and a knowledge of what certain chemicals have done with other parasitic Fungi, it is reasonable to conclude that the compound of cupric carbonate in ammonia would prove a great assistance in ridding truck-farms of this serious pest. The formula for the Grape-rot found most effective is, three ounces of the copper carbonate in one quart of ammonia and diluted to twenty-two gallons with water.

It is a well known fact that some varieties of Celery are less susceptible than others—the "White Plume" has an excellent record, as being comparatively free from the disease.

The recent heavy rains that have fallen throughout the country will prove a great blessing to the Celery crop. They will infuse new vigor into the plants and at the same time check the growth of the blight for awhile, for it seems to be a lover of dry weather. Shading the young plants with lath or boards high above the rows has sometimes saved the crop.

Among allied plants the Carrot is the one most susceptible to this blight. A variety of the same species is found upon the Parsnip, and an abundance of wild Carrot and Parsnip in a region may be propagating places for the Celery blight.

Rutgers College.

Byron D. Halsted.

Planting Daffodils.—The time for this work is at hand, and the question arises, How deep ought they to be planted? First-rate authorities on this subject advise shallower planting than I have found desirable, recommending in general a depth of four inches from the crown of the bulbs to the surface of the soil, but, of course, allowing a difference for the size and kind. It must be remembered, however, that this refers to bulbs which are lifted and transplanted every year, and this makes a great difference. Where bulbs are to be left for several years without being moved, I am inclined to think

that deeper planting is better—quite twice as deep as that above mentioned.

No one should venture to lay down an absolute rule on such a subject, as soil makes a great difference, and experience is the best guide in every garden. But I find that in this deep and retentive soil, shallow planting produces a tendency to multiply rapidly, to the deterioration of the size of the bulb and the flower. I have certainly noticed, in beds of wild Daffodils, that when I have selected an individual of extra large flower and growth, the bulb is deeper than average, and larger if reached. I have found the same rule hold in my garden. Newly purchased bulbs, if fine and well ripened, will the first year produce equally good flowers, if planted in good soil, whether planted deep or shallow. To judge of the respective merits of deep and shallow planting, the second and third flowering season must be waited for; and I should recommend those who wish to decide between the merits of the different depths to divide a dozen similar bulbs, planting in the same border and soil, half at a depth of nine inches and half at a depth of four, and, having labeled them carefully, without disturbing them in the interval, to let us know the result when they are in flower in 1893.—C. Wolley Dod, in *Gardeners' Chronicle*.

Aster Novæ Angliæ.—This is one of the handsomest species of the large genus the greater portion of which are natives of North America. Novices are often puzzled to know which of the many kinds catalogued are good and distinct varieties for garden decoration. This is the less surprising since enterprising nurserymen advertise well known species under names which Professor Gray never heard of. The New England Aster is by no means peculiar to the eastern states, for we are told it is found from Canada and Saskatchewan to South Carolina and Colorado; it is one of our best tall-growing plants and never fails to give an abundance of bloom in the autumn months. In the back rows of large borders, and when used in conjunction with other tall-growing plants, such as *Helianthus orgyalis*, it is very effective. The variety *Roseus* has rays as large as the type, and of a deep shade of rose that is very pretty in contrast with the blue of the species. One thing more needs to be said of this class of hardy plants that form great clumps in the border, which is: that one should never hesitate to divide them when they have become large. This should be done directly after the flowering season is past, or, better still, in spring, before growth commences. The clumps may be carefully broken up and replanted in the same place, provided a liberal quantity of manure is placed beneath them. This should not be allowed to come in contact with the roots, but should be first covered with soil, upon which the plants may be set. A healthy and deep root action will thus be ensured, and any check to growth in a dry season be prevented.

South Lancaster, Mass.

O.

Inula grandiflora.—In reply to Mr. E. O. Orpet's queries, I beg to state that seeds of this plant were received from the Himalayas through the liberality of Dr. King, at Calcutta, under the designation "Composite, species." I called it "grandiflora" in accordance with a suggestion from Sir J. D. Hooker when describing *I. Hookeri*. It may, however, turn out to be an entirely new species. In any case it is a very showy and easily cultivated perennial.

Delphinium Zalil is a native of Afghanistan and was sent to Europe by Dr. Aitchison. It flowered here two years ago, and is a showy annual or biennial, the average height here being two feet. The flowers in its native haunts are used as a dye for leather. The coriaceous, fleshy roots are often exhausted the very first year by abundant flowering, and never keep longer than two years.

Ostrowskya magnifica, perhaps, may not be quite hardy in the northern states of America. I lost several hundred last winter, when the frost was not serious. It is a gorgeous plant and well worth all the care it requires. The seed very soon loses its power of germination, and should be sown a few weeks after it ripens.

Baden-Baden.

Max Leichtlin.

Japanese Anemones.—These plants have been so often commended for autumn display that it almost seems superfluous to refer to them again. They are especially welcome at this season of the year, when few plants are in bloom in the borders, which unavoidably have now a ragged appearance. They make excellent pot plants; specimens with over a hundred blooms open at once, in twelve-inch pots, are very striking. The length of time they remain in bloom, four to six weeks, still further recommends them. Their culture is very

easy. Good loam, yearly repotting and liquid manure when forming the flowering stems; these seem to be all the requirements necessary to insure success; yet, we seldom see them well grown.

Wellesley, Mass.

T. D. H.

Clematis paniculata.—For a vigorous growing, profuse flowering species this cannot be excelled. The long shoots of this plant, now in bloom, are furnished with crowded clusters of feathery, fragrant, white flowers, which, though small, are borne in such wild profusion that the vine appears as a mass of white. The lower vine is well furnished with large, firm leaves. A Clematis which will make eight or ten feet of vigorous growth in its first season, is free from disease and flowers so profusely, is an ornament to any garden.

Newark, N. J.

7.

Correspondence.

Home Experimental Gardens.

To the Editor of GARDEN AND FOREST:

Sir.—The value of experimental stations varies according to the good judgment of the Director and the wide diffusion of results in an intelligent form. I believe, however, that, as a rule, we get as reliable reports to guide general cultivation from private experimenters. I have in a long course of trials learned to rely on one or two special sources of information in each special field of work. If I wish to know the truth about a new Strawberry I compare the judgment of such men as Crawford, Williams and Miller; and there are two or three of the state experimental stations I am glad to hear from. What I wish to urge is that we shall all of us establish a series of home experiments, and make it a fixed part of our annual efforts in horticulture. These experiments, when they reach fixed results, should be reported on in such a way as to reach the general public.

For many years I have made it a point to cross-breed or specially select both among flowers and vegetables. For ten years I have carried on a series of experiments with Beans, Corn and other garden products. I have raised a Pumpkin that kept with dry storage all summer; but have not held it to be of sufficient value to disseminate. My experiments with Strawberries have never given but two promising sorts, and one of these may at some time prove to be worth general testing. In Raspberries I am testing a strain of very early red seedlings that so far promise to be superior to Turner, Marlboro and other early sorts—certainly far ahead of Hansell, Crimson Beauty and Lost Rubies. I have no Blackberry that I am certain of, but some good ones. Black Raspberries follow their parentage very closely. What I hope for is a seedling Gregg that shall be absolutely hardy. Seedling Grapes have shown some good points, but nothing to warrant their being sold. The Gooseberry is a grand fruit, growing slowly into popularity. I have succeeded in starting, or rather finding, a true cross of native and English that, after five years' test, I believe to be an advance on what we have.

Corn I have crossed quite to my heart's content, and the result is many very good sorts, from very early to very late; but I am not sure that they should be offered to the public. In Beans I have had better success. A white Wax-pod ten inches long and three inches around is big enough. The beans inside in some sorts number nine or ten and are white in color; in others pink or yellow.

Comparative culture opens another admirable field for home experiments, only that it requires far more patience than is often exercised. Very many reports as to the comparative merits of deep or shallow planting, level or hill culture, the merits of seed from the end or from the middle of the ear, of small or large tubers, etc., are vitiated by the variation of seasons.

But whatever results may prove of advantage to the public, these experiments are of immense importance to the farmer or gardener who works at them, and to his family. They lend a charm to rural life that is hardly obtainable in any other way; turning hand-work into head-work, and drudgery into poetry. The effect on children is most admirable. I should by all means allow each child a special part in a special experiment; let him work it out himself. Here he gains the power to investigate and observe, which makes all scientific research and acquisition possible. An experimental plot is better than botany books. Hired men will also be greatly improved by being engaged in comparative culture.

Clinton, N. Y.

E. P. Powell.

Shirley Poppies.

To the Editor of GARDEN AND FOREST:

Sir.—Will you be kind enough to tell me what is a Shirley Poppy and how it differs from other Poppies?

Morristown, N. J.

B.

[These Poppies were produced by selection by the Rev. W. Wilks, of Shirley Vicarage, England. Mr. Wilks found in a corner of his garden a stray lot of the wild scarlet field Poppy (*Papaver Rhæas*), and amongst them he noticed one blossom whose petals were distinctly edged with white, with their bases shading into the black of the stamens. A second plant he found near his home with the same white edging, and having saved the seed, the next year gave him a few blossoms which were more or less edged with white, and some others of a paler shade of red. The seed of the most distinct ones was saved from year to year, and Mr. Wilks is positive that he still finds improvement in the plants. In some of them all the dark tinge has been removed at the base of the petals, and golden stamens and anthers have taken the place of the sombre centre of the flower, and the color of the petals varies from pure scarlet to paper white, including all shades of pink and salmon-pink.

The plants have grown in vigor and robustness of habit as well as in beauty. The strain has become so well established that not more than one per cent. of "rogues" or black-centred flowers are found. A good colored plate of these Poppies was published in *Amateur Gardening* July 5th, 1890.—Ed.]

The Fay Currant.

To the Editor of GARDEN AND FOREST:

Sir.—I observe that Mr. E. P. Powell speaks disparagingly of the Fay Currant in your issue of July 23d. My experience has differed so completely from his that I am led to inquire whether his views are generally accepted. Either the conditions at his place are exceptionally unfavorable for this fruit or the conditions with me are unusually good, for it is by odds the best Currant I have ever tried.

New Haven.

S. V. C.

[So far as our observation goes the Fay Currant is altogether a superior fruit. Many correspondents corroborate this opinion. Dr. Hoskins, for example, writes from Vermont that it is a great success with him and far ahead of the Versailles on rather light soil. The clusters are almost like Delaware Grapes in size, they sell well, and no complaint is ever made of their quality. Mr. S. D. Willard writes from Geneva that his experience with this Currant is most favorable, and he adds that he considers this the prevailing sentiment among horticulturists of western New York.—Ed.]

Recent Publications.

The Trees of North-eastern America. Illustrated from original sketches. By Charles S. Newhall. 8vo, pp. 242.

This work has been prepared for the sole purpose of enabling persons who have no botanical knowledge to identify the native trees of Canada and the northern states east of the Mississippi River, and a few—some twenty or more—of the more common species that have been introduced and naturalized in this region. The characters used are few in number, and mainly those which are most obvious. The leaves of the trees are principally relied upon in the descriptions given, and the classification is based on leaf-forms exclusively. The plan is for the student to take a leaf of his specimen, and follow it down through a few of its plainest characters—that is, whether simple or compound, alternate or opposite, entire, toothed or lobed, and if the latter, whether the lobes are entire or toothed. Having pursued his specimen to this group the student will find the leaves of all the trees of its class rather coarsely figured from what appear to be actual impressions from typical specimens. The figures are accompanied by brief descriptive text, which gives additional data for identification, drawn from the bark, flowers and fruit.

Since the book has an aim so definite it may have been advisable to omit any details that are not absolutely needed for

that single end. For example, there is no need of giving any description of the winter-buds of trees, for the key can only be used with the leaves. No mention of their flowers is made in the case of several trees, and perhaps it is enough to say of the flowers of the Sassafras, "greenish yellow, in clusters, May, June," or of the Yellow Willow, "blossoms, May." But such information is not very specific or satisfying. We may not unreasonably hope, however, that one who has taken the pains to identify a tree by means of this artificial guide will continue his investigations until he learns something of it besides its name. The truth is, however, that very few people comparatively can identify half the trees in our woods or by our roadsides, and this book will render a worthy service by helping all who follow its plain directions to call our familiar trees by their proper names.

Professor N. L. Britton has been followed as the authority on scientific nomenclature.

Report on the Substitution of Metal for Wood in Railroad Ties. By E. E. Russell Tratman. Published by authority of the Secretary of Agriculture, Washington.

This report has just been issued by the Forestry Division of the United States Department of Agriculture as "Bulletin No. 4," and while it has a special interest for railroad managers and engineers, it will be found of value to all intelligent people who give attention to the subject of forestry in general as one of the necessary economies of modern civilization. Mr. Tratman, who made this investigation on the consumption of ties, obtained his information by addressing the managers of various railroads at home and in foreign countries, and they furnished full information in reply to numerous circulars and letters. The report covers some 350 pages, besides many careful illustrations, so that it will be impossible to give anything like a summary of the information given. It is sufficient for the present purpose to say that probably there are now in the world 30,000 miles of railway laid on metal ties, which amounts to nearly sixteen per cent. of the total mileage of the world, exclusive of the United States and Canada. These figures show not only the great importance of the subject considered, but they show also that in other countries this subject has long ago passed the experimental stage in which it still remains in this country.

Of course the use of metal ties is in the interest of forestry and in the interest of the timber resources of the country, but it is also in the interest of the railways, because it reduces the expenses of maintenance and increases the safety of operation. Mr. Tratman concludes, therefore, that the introduction of metal ties will be a benefit to the forests, to the railways and to the public. The indirect value to the country and to our forests of this change to metal ties can only be realized when we consider the large amount of forest-supplies that are used in railway construction. Probably the railways use not less than one-fifth of all the timber consumed in the country. But what is of more importance, the material represented in this consumption is drawn largely from thrifty young growth which is the promise of the future, so that the timber crop is used before it has reached its most profitable age and largest production to the acre. Besides this, the most durable and valuable timbers only are desired, and consequently the forest-areas from which these kinds are culled must deteriorate in quality, the inferior ones being left to dominate and exclude more valuable kinds which are thus placed at a disadvantage by the unintelligent action of man. That this is true is proved from investigation in the forests of Kentucky, where White Oak represents forty per cent. of the natural growth, while after the timber has been culled the new growth contains not more than five per cent. of this valuable railroad timber.

The great bulk of the tie material is now cut from second growth, especially in the eastern states, and young timber that will make only one tie, or at least one tie to the cut, is called for in most specifications. This careless consumption of the best parts of the new growth must injure the future forest; for we draw in this way upon the fund which we should hold in trust and should allow to accumulate for the next generation. We do worse, indeed, because we do all we can to depreciate the value of the investment by injuring its quality.

Many considerations of this sort are brought out in a suggestive introductory note by Mr. Fernow, from which we quote the following:

"It has been shown repeatedly that our annual consumption of wood products at present exceeds double the amount of wood material that can possibly reproduce itself annually on the area covered with wood growth. It is, therefore, of national interest and within the line of work of this Division to call attention to the necessity of husbanding timber supplies,

and to furnish all and any information that may lead to a more economical use of these supplies or a substitution of other material where this is practicable. While such economy is desirable in all directions, it is especially so in regard to tie-timber, since, for this purpose, the promising crop of the future is utilized prematurely—and that of the best quality and of the most valuable timbers. Furthermore, it should be known that for those who furnish these supplies for the railroad companies there is but small, if any, profit in the trade. The ties are in most cases brought to the railroads by holders of small wood-lots, and the price paid is hardly more than fair compensation for labor in making and hauling them, no value being placed upon the material itself.

"It has been suggested that railroads could be induced to substitute metal for wood only when it could be shown that an increase in the price of wooden ties is imminent. But from this report it appears that the price paid for ties in many localities is now even lower than it was formerly, notably in the north-eastern states. Yet it would be a mistake to argue from this, as a general proposition, that more timber is in the country than before, that forest-supplies are in excess of demand, and that prices are going to decrease continuously.

"The law of supply and demand as affecting the price of this commodity is vitiated by other conditions which influence the price. It is the excessive offer compared with the requirements, rather than excess of actual visible supplies available for the long run, that places the purchaser of this commodity in position to dictate the price, the offer coming from many holders of small parcels, who have no knowledge of general market conditions, and hence cannot take advantage of a comparison between actual supplies in view and demand for the present and future in adjusting the price.

"A timber crop, unlike an agricultural crop, is capable of being harvested at various stages of development. Timber fit for ties may be cut at any time, from the twenty-year-old sprout of the coppice to the old growth of the virgin forest, and the offer of the crop in this shape may be excessive at any time without necessarily indicating an over-abundance of forest-supplies in general and for the long run. The accidental simultaneous arrival at an age when the timber is fit for ties of a new growth over a large area may also in a given region make supplies appear plentiful, and, therefore, for a time reduce the price; but this present over-supply and reduction of price must necessarily be at the expense of a future short supply and increase of price. Another reason for an apparent over-supply of tie timber may be found in the opening up of new sources of supply on such roads as are capable of extension, while the old roads, with no new fields to enter, will necessarily experience a constant advance in prices with decreased offers, and will be the first to have recourse to metal on account of cheapness.

"It should also be known that, within limits, a railroad management has it in its power to keep the price low by raising freight rates, so as to make the exportation of tie timber from its territory unprofitable. The condition of the tie market, then, cannot be the only, or even the main, criterion as to when the time for substituting metal has arrived, even from a financial point of view.

"But it is not a consideration of initial cost that makes the substitution of metal ties desirable and profitable. It is superiority of track, permanence of road-bed, safety, reduced cost of maintenance, and hence ultimate saving and economy, that recommend the metal tie, as the experiences in foreign countries have proved.

"A curious lack of accurate calculation is often seen when comparisons are made on the balance-sheet between various systems of construction. If initial cost alone is considered, all financial questions are settled by the amount of cash on hand, but the question with stable corporations is whether temporary saving in initial cost is preferable to greater initial expenditure where it ensures decreased outlay for maintenance and deferred expenditure for renewal.

"From a simple calculation it will appear, for instance, that a road using ties for which it pays fifty cents, and which last eight years—like white Oak in many sections—can afford to pay \$1.20 for a metal tie lasting thirty years (the presumed life of such ties) and be sure of saving at least the amount required for the renewals of the Oak ties during thirty years; or, by doubling the life of the Oak tie to sixteen years by means of preservative processes, we may pay thirty-five cents for such process and still find an advantage on the balance-sheet."

The Bulletin also contains a paper by Mr. Fernow on the consumption of forest-supplies by railroads and practicable economies in their use, to which, as well as to some details of Mr. Tratman's work, we hope to refer in a future issue.

Notes.

The eleven parks in the City of Philadelphia are estimated to contain 2,884½ acres of ground.

General Bidwell has added 700 acres to his orchard in Chico, California, so that it now covers 2,200 acres.

Mr. Carl W. Hartmann, of Sweden, is the botanist of the Lumpholtz Mexican Exploring Expedition, which started from Arizona on August 30th, and hopes to return in the autumn of 1892.

English journals say that the custom of tree-planting by school children on a certain day in each year has been imported from America into Australia, in accordance with the decision of the Minister for Public Instruction. There, as here, the day will be known as Arbor Day.

A garden of Pampas Grass ten acres in extent is one of the objects of interest to tourists who visit Anaheim, California. This year about 40,000 plumes will be harvested, and the yield after the plants become fully established will average 100,000 plumes. These plumes bring about five cents apiece.

As the fragrance, if not the savor, of strawberries is injured by washing, the *Revue Horticole* recommends that, when it is desired to free them from sand, they should be gently bounced in a piece of damp muslin. The sand will remain attached to the muslin and the delicacy of the fruit will not be impaired.

Mr. E. S. Miller, writing from Floral Park, Long Island, in reference to Mr. Orpet's method of propagating Achilleas from underground stolons, says that his way of getting a stock of these plants is to store the old ones in a shed until January, then plant them in a bench and take cuttings from the young wood from that time on until May. Plants struck as late as May, if planted out, make very strong roots and give an abundance of flowers.

The *Garden* says of *Lilium Henryi*: "The species is a new one, and was discovered in western China by Dr. Henry, who sent a few bulbs of it to Kew last year. The habit of the plant is that of *L. lancifolium*, but taller; the flowers are in loose corymbs, specimens showing as many as eight flowers on each stem; they are reflexed as in *L. lancifolium*, three inches across, and colored rich orange-yellow, with a few tiny dots of purple. As a decorative plant this species will take rank with *L. tigrinum* and *L. superbum*."

The *Garden* recently noticed a new Peony as both "curious and beautiful." It is called *Pæonia Wittmanniana*, and "when the leaves first appear their bright, pale, golden green color must strike any grower of plants accustomed only to the deep toned leaves of the better known herbaceous kinds. But the picture is complete when the flower appears, of a beautiful and delicate color that may best be described as strong primrose with a dash of lemon. The texture of the petals is so firm as to remind one of a Magnolia, and the seed-pod is a bold and handsome object."

The *Gardeners' Chronicle* for August 18th described at length American methods of evaporating fruit, prompted by the fact that the subject had been discussed at a recent meeting of the Royal Horticultural Society. It seems that the industry is as yet unknown in England, but it is believed, might profitably be developed there, although the fruit production of the country is on a scale so much smaller than our own. The best way of introducing it, one speaker at the meeting had said, would be for some land-owner to "set up one of these American evaporators, so as to give his tenants and neighbors an opportunity of testing its value."

Under the title of *Variétés Bibliographiques* Monsieur Rolland, a Parisian bookseller, is now publishing an interesting, popular flora, which is to include as many vernacular names for each plant as can be discovered, and also all the stories, superstitions, proverbs and customs relating to the plants and flowers of all parts of the world. As an extreme example of the perplexing number of common names which may be borne by a well known plant a foreign reviewer cites from this book the case of *Clematis vitalba*, for which more than 200 such names are recorded, not, of course, in French alone, but in the different languages included in the scope of the encyclopedia.

Boston journals announce the closing, after a most successful third season, of the seventeen summer play-grounds for little children established by the Massachusetts Emergency

and Hygiene Association. Almost all of them were public school-yards, and although in only one was it possible to form a flower-garden, the open spaces, filled with heaps of sand, supplied by charitable individuals with toys, cut flowers and sea-shells, and superintended by a matron, have given health and happiness to a multitude of indigent children who otherwise could have found recreation only in the gutter. The average attendance for the whole summer was ninety children daily at each of the yards. At some of them the daily total occasionally rose to as many as 200.

In spite of the unfavorable year the horticultural exhibit at the New Jersey State Fair at Waverly last week, and especially the display of apples and pears, was unexpectedly fine, although not as large as usual, while the grapes were fully up to previous exhibits, and potatoes were abundant and superior in size and smoothness. The most tempting of the pears were from cold storage; the Bartlett's, Boussocks and other early varieties being especially attractive. The greater part of the grape display came from Montclair, and finer clusters of Brighton, Cottage, Concord, Worden and Niagara were never seen anywhere. Samples of the new white grape, Colerain, were on exhibition. The clusters and berries were of medium size, but the quality was pronounced excellent by all.

The *Evening Transcript*, of Boston, recently gave, on the authority of the *Westborough Chronotype*, an account of a great Elm-tree which stands in the westerly part of Framingham, Massachusetts. It was transplanted from the woods by one Jonathan Rugg in the year 1774, and set in rich, moist ground to shelter a little house which had been built just seventy years earlier. At one foot from the ground it now measures twenty-eight feet six inches in circumference, while the girth of its largest limb is ten feet three inches. The circumference of its noon-tide shadow is 295 feet, an area, we are told, "that would readily accommodate two thousand people." Under one huge branch stands a two-storied farm-house and a flight of steps ascends the trunk and follows another limb to the place of its forking, where a capacious summer-house has been built. The giant tree is still healthy and vigorous.

French journals lament that unfavorable weather has almost altogether deprived the country of fruit this year. A disastrous amount of rain has so afflicted the central, northern, western and south-western districts that the markets have been almost bare of fruit except such as had come from the south. One correspondent, writing from the Department of the Seine-et-Marne, says: "We have had neither cherries nor apricots nor plums; apples have been greatly injured by hail; pears have suffered less; but our grapes will not ripen." And another, writing from Brittany, says that there the pears are all spoiled, apples are lacking in many localities, and almost all the plums had perished; that peaches are everywhere non-existent; that gooseberries and raspberries had been relatively scanty, and that, although strawberries had been quite plentiful, they "had only the form of the fruit with the taste of water." Meanwhile, complaints of excessive drought have been coming in from the south, where, we are told, even in carefully watered gardens, the trees and shrubs had faded and withered. Near the coast the moist sea-breezes "assure the abundance of the grape crop," but further north grape-growers are reported to be in despair over the persistent dryness.

We are accustomed to hearing the Ailanthus condemned as an avenue-tree, because of the irritating effect of its pollen on the bronchial tubes and its consequent offense to those who are afflicted with "hay fever." But, according to one of the editors of the *Revue Horticole*, the Plane-tree is equally undesirable, by reason of the fine hairs which cover the lower surfaces of the leaves, the buds, and even the young fruits. "These hairs, being extremely light, spread through the air, and, introducing themselves into the respiratory tubes, irritate the mucous membrane to such an extent that workmen in nurseries are obliged to cease their labor during the heat of the day. These facts are so well known, that when the grafting of Planes or even the clearing of the soil where they grow is in question, care is taken to have the work stopped when the sun rises and the dew disappears, because then the hairs detach themselves and cause an irritating cough, which sometimes even produces hemorrhage. The danger is said to be much smaller in streets than in nurseries, for the trees are then lifted well above the ground and the wind carries off most of the injurious hairs; nevertheless, the writer pronounces it a genuine danger even under these conditions, and calls to it the attention of those who superintend the planting of Parisian streets."

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The Tupelo Tree.

THE forests of eastern America contain few trees more interesting to the botanist or of greater ornamental value than the Tupelo, Pepperidge, Sour Gum or Water Gum, as one of the American representatives of the small genus *Nyssa* is popularly called in different parts of the country. This genus was so named by Linnæus for a water nymph, because the species known to him, inhabitants of our far southern states, grow usually in shallow ponds or deep swamps overflowed for a considerable part of each year. Its nearest American relatives are the Cornels, from which *Nyssa* differs principally in its five instead of four-parted flowers, which are rarely perfect, but produce their male and female organs separately, while the flowers of the Cornels are perfect, and, in its alternate leaves, the leaves of our Cornels being opposite except in the case of a single species.

The distribution of the genus is exceptional and interesting. Three species, or four, according to the opinion of some excellent observers, inhabit different parts of eastern North America from Maine to Texas. One species, a tree of some size, occurs at considerable elevations on the Sikim Himalaya, and one or two little known species are found on the mountains of Java. The genus has no representative, strange to say, in the flora of China or Japan, where so many of the types of eastern America occur; and paleontologists have not yet brought to light any indication that the ancestors of existing species inhabited a larger part of the earth's surface than these species do at present.

This is not the place, and it is not our intention, to discuss at this time the limits of the different American species, which have puzzled botanists ever since they have known them, the confusion beginning with Linnæus himself, who included two very distinct species under his original description. It is our purpose merely to call attention to one of the species still little known or appreciated by planters as an ornamental tree. This is the *Nyssa*, which is generally distributed through all the eastern portions of the United States south of the southern part of the state of Maine and central Michigan. *Nyssa aquatica* appears to be the correct botanical name for this tree,

although it is only in the extreme south that it grows in water. Near the coast of the northern states it always grows by the borders of swamps in low, moist ground; and in the interior, especially on the lower slopes of the high Alleghany Mountains, where it attains its greatest size, it is found at considerable distances from the water-courses associated with the Oaks, Magnolias, Hemlocks, Hickories and Ashes which form the principal part of the forest-growth. Here the Tupelo grows sometimes to a height of considerably more than a hundred feet, with a tall, stout trunk three or four feet in diameter, and short slender branches, contracted in their development by its neighbors in the forest. Near the coast it is always a much smaller tree, especially in the southern states, and it is rare to find it more than fifty feet high except in the mountain forests or in those of the lower Ohio valley—a region of exceptional and extraordinary tree-growth.

The habit of this tree as we see it near the coast is very different from that which it assumes when growing in the dense forest, for, as it grows near the coast in low, wet land, which produces generally few trees, the individuals have sufficient room for the development of their branches, which are long and nearly horizontal, producing a flat, often umbrella-shaped, top. This is the familiar form in which the Tupelo is seen in the neighborhood of this city, either along the shores of Long Island Sound, where it abounds, or the New Jersey coast.

The leaves vary much in size and somewhat in outline on trees in different parts of the country, the largest and broadest being produced on the Alleghany Mountains, and the smallest in the Florida Pine-barrens. The flowers in the different forms vary, however, very little. The staminate flowers are produced in dense clusters, while the female flowers are borne two to fourteen together at the summit of an elongated peduncle. The blue-black fruit, of which rarely more than two are developed from a cluster of flowers, varies somewhat in shape, and very considerably in size, in different parts of the country, as do the seeds, which have been depended on to divide the species. But the botanist, with a large series of specimens gathered from trees growing under the various climatic conditions to which this species is subjected, finds it a difficult task to distinguish characters which can be depended on to establish varieties even which do not pass imperceptibly one into another.

The Tupelo was introduced into England in 1808 by John Lyon, an English plant-collector who traveled widely in North America early in the century. It was doubtless sent earlier to France, as it is hardly possible that Michaux could have failed to introduce such a distinct and beautiful tree into the plantations of his native land. Whether this is true or not it is certain that no American tree is now more rarely seen in Europe, and a really fine specimen outside of America is not easily recalled. This is due, perhaps, to the difficulty which is always experienced in transplanting this tree after it has been allowed to remain undisturbed for any length of time or after it has attained to any considerable size. The roots are remarkably stout and long, with few rootlets, so that the trees are never easy to move unless they have been grown in the nursery and specially prepared for transplanting. It is easily raised from seed, however, the seedlings are easily transplanted, and if they are set while still young where the trees are to grow permanently, no difficulty will be experienced with them. Even large plants dug up in the swamps can be successfully moved if extraordinary care is taken in the operation, but for the ordinary cultivator it is best to depend on small, nursery-grown plants when they can be obtained.

The Tupelo should be more often seen in ornamental plantations than it is at present. The habit of this tree when allowed sufficient room in which to grow is striking and interesting and quite unlike that assumed by any other of our hardy trees. The foliage is abundant and lustrous, and in the autumn it assumes a brilliancy and splendor of coloring

unrivaled by that of our other trees. It is one of those trees which always attract attention—in the winter by its peculiar habit, in summer by the beauty of its foliage and in autumn by its coloring.

The wood of this tree is nearly white and very light, but with such an intricately contorted grain that it can be split only with the greatest difficulty. It is valuable, therefore, and now considerably used for the hubs of light wheels and for rollers in glass factories, for ox-yokes and similar purposes.

The value of the Tupelo as an ornamental tree is shown in our illustration on page 491 representing a group of these trees growing naturally near a small pond in the town of West Medford, Massachusetts, and made from one of the excellent tree portraits for which we are indebted to Mr. Henry Brooks.

Nyssa aquatica is a small-fruited species, the stone marked by broad, rounded ridges; the fruit of the two other American species is very much larger, the stones being marked with prominent acute or winged margins. The first of these two species is the *Nyssa uniflora* of botanists, so called because the fertile flowers are solitary. This is a large tree, usually known as the Cotton Gum or Big Tupelo, a hundred feet or more high, and an inhabitant of deep river-swamps, where it grows in immense quantities, generally with the Sweet Gum, from southern Virginia and southern Illinois and Indiana to Florida and Texas. It has ample, usually angular-dentate leaves and peduncled fruit half an inch long, known in the country where it grows as wild olives. It is one of the largest, handsomest and most abundant of the river-swamp trees of the southern states. According to Aiton, it was introduced into England as early as 1735 by the indefatigable Peter Collinson, who no doubt received it from his constant correspondent, John Bartram; it was probably soon lost from gardens, and it is extremely doubtful if it is now anywhere known in a living state outside its native swamps.

The other American species of the genus is a smaller tree than either of the others and much more restricted in its range. It is the so-called Ogeeche Lime, the *Nyssa Ogeche* of botanists, of the coast region of South Carolina and Georgia, and of a few isolated stations of northern and western Florida. It is a shrubby tree, with staminate flowers in large clusters, the fertile solitary and usually perfect. These are followed by olive-shaped scarlet fruit nearly an inch long, and very acid even when fully ripe. It is collected in considerable quantities, being much esteemed when preserved with sugar for its sub-acid flavor. It is known as wild limes or Ogeeche limes. It is doubtful if this tree, although known to Bartram, Marshall, Walter and the early American botanists, has ever been cultivated, although it might well be grown for its fruit in regions where the Orange flourishes.

DURING the discussion on landscape-gardening at the Boston Convention of Florists Mr. C. B. Whitnall, of Milwaukee, in the course of a well constructed argument to justify the use of a natural combination of simple elements in park planting as against the more highly-ornate style, which also had advocates, quoted the following sentence from Mr. McMillan's now famous essay: "The lights and shadows of a painting are carefully studied, and whatever is appreciated in the copy is surely of greater value in the original." Mr. Whitnall went on to inquire if any one ever heard of a noted artist who spent time in copying ribbon lines or carpet patterns or any other of the formal garden designs which may be classified under the general head of decorative planting. Of course, every one must admit that the genuine artist would prefer some nook in the wild-wood or some other piece of unadorned nature as a subject; but, after all, this hardly proves that so-called decorative gardening is altogether to be rejected. It only demonstrates in another way the truth of what we have before stated, and what is no doubt the belief of Mr. Whit-

nall himself, that there are two distinct kinds of gardening. It does not follow that a piece of embroidery is not beautiful and useful in its proper function because an artist does not choose to put it on canvas, nor does it follow that a formal arrangement of plants may not have a legitimate use in certain places because it is not a fit subject for the brush. A true artist must express some sentiment. It is the inner meaning of his subject which he aims to interpret; but an arrangement of plants and flowers which is meant to be strictly ornamental addresses itself to the æsthetic faculty alone, and although it may give great delight on account of its perfect form and brilliant color its beauty is evanescent and superficial. Decorative planting of this sort is essentially transient. The arrangement of the beds may be altered a dozen times during the year, and they are sure to be changed with each season. It can have none of the associations which cluster around a work which has a permanent and continuous life beneath an ever-changing outward form. On the other hand, a natural landscape may have the beauty which an artist always wishes to reproduce, but it may have in addition a profounder meaning which excites the imagination and moves the feelings. All this means that landscape-gardening which deals with the permanent features of scenery, with the sky line and the distance and the shadowy mystery of wood borders, will always furnish subjects for the brush of the artist, while merely decorative gardening, which is concerned with the temporary adornment of smaller spaces, furnishes no such subject. In other words, it offers additional evidence that there are two kinds of garden art essentially distinct in purpose and in effect. There is no necessary conflict between the two styles of planting, but it is plain that each should be restricted to its legitimate field. Any attempt to combine the two by unskilled hands is likely to produce an incongruity in which the best effect of each will be more than neutralized by the other.

Shrubs which Endure Drought.

BARBERRIES.—Some of the Asiatic Barberries have stood the heat and drought in a surprising way. Of these *B. Amurensis* stands well at the head for rapidity of growth, health of foliage and for the very heavy crop of handsome fruit. Several other species are also clean and healthy and loaded with varied and handsome fruit, under conditions which have favored the Cluster Cup Fungus and stunted growth on the common species from west Europe. Among the perfect ones I might name *B. esculenta*, *B. macrocaulea*, *B. carriacea*, *B. Fisheri*, *B. macrophylla*, *B. cratagina*. Our observations favor the belief that in our climate a number of so-called species are free from the Cluster Cup Fungus.

RUSSIAN PRIVET.—While classed as varieties of *Ligustrum vulgare*, the Privets from central Russia are quite unlike the common forms from west Europe, which are tender here. The leaves are broader, darker green, and in all respects more attractive; the plants are absolutely hardy, the flower-racemes are larger, pure white and fragrant, and the bunches of berries are larger, as are the individual berries. When in blossom the flowers were much worn by the ladies on the college grounds and prized for use as cut flowers in vases.

TAMARIX AMURENSIS.—Here the common Tamarix is frozen down during our mildest winter, while that from the Amur is perfectly hardy. It is a dry climate plant, and will grow on the driest embankment in perfect health where nearly all other shrubs would perish. It is now (September 18th) in flower for the third time this season.

CLIMBING HONEYSUCKLE.—What we have from Russia as *Lonicera Germanica* and *L. media* are models of health and vigor, with a grand show of brilliant scarlet berries in clusters at the points of growth. *L. confusa*, as we have it from north-east Germany, appears to be identical with *L. Halleana* from China, but it is a hardier plant and a more profuse bloomer.

BUSH HONEYSUCKLES.—*Lonicera splendens*, from seeds sent us by Professor Sargent, endures drought better, has better foliage and habit, and has a far more abundant crop of handsome fruit than the common *L. Tartarica*, *L. Zyloteum*, *L. Ruprechtiana*, *L. Alberti*, and a half dozen named varieties from

France and Germany of the Splendens type are superior in every respect to the old varieties, and are now loaded with handsome fruit, shown amid clean, handsome foliage.

SALIX ROSMARINIFOLIA.—As an object lesson the attention of the junior class in horticulture was to-day directed to the plants of *Salix rosmarinifolia* from Ellwanger & Barry, and to the variety of the species from Voronesh, in central Russia. Since July there has not been a leaf on the west European variety, while at this late date the Russian form is clothed with perfect dark green, Fern-like foliage, and is an object of beauty. At any season and in any part of the country the Rosemary-leaved Willow from the East will be prized as a lawn shrub.

ROSES.—The varieties of *Rosa rugosa* from China, central Asia and Russia have not flagged a leaf or made less apparent growth than usual during the dry period.

SPIRÆAS.—Of the hardy varieties and species the most perfect and vigorous have been *S. triloba*, *S. Van Houttei*, *S. callosa alba* and *S. rubra* from Russia, *S. hypericifolia* and *S. Nobleana*.

CARAGANAS.—The most northern species, such as *C. arborescens*, have not endured the heat and drought without partial or complete loss of foliage. But some of the shrub varieties from the eastern steppes have stood remarkably well and flowered profusely. Of these *C. fruticosa*, *C. fruticosa variegata*, *C. macrophylla*, *C. mollis glabra* and *C. Redowsky* stand well at the head.

This list only includes a few trees and shrubs studied as object lessons by the junior class yesterday and to-day.

Iowa Agricultural College.

J. L. Budd.

Judging the Quality of Apples.

THE *Maine Farmer* reports Pomologist Van Deman, of the United States Department of Agriculture, as saying in his address to the fruit-growers at the state fair in Lewiston: "I hear that you have taken to testing the Russian apples, which are very poor in quality"; and I wish to enter a protest against the hasty and inconsiderate way in which whole classes of fruit are condemned together. It cannot be justly said of the apples of any country that they are "very poor."

English apples are looked upon by Americans as inferior to their own varieties; and it is even claimed that the best English apples—the Ribston and Blenheim Pippins—are better grown on this side of the Atlantic. But the English, while admitting the brighter color of our apples, deny that the quality is better than in those produced by their own skillful fruit-growers.

When we speak of the quality of apples, the uses to which they are put must be considered. Downing says of the Talman Sweet: "In quality this fruit is scarcely second-rate, but it is a very popular and profitable sort." All over the country Ben Davis meets with criticism as to its quality, yet it is undoubtedly the leading commercial apple of the United States, and Downing classes it as "good to very good." Among Russian apples, Alexander, Red Astrachan and Oldenburgh are rated high upon the American Pomological Society's select list of 369 varieties. This high rating is not accorded to any of these five sorts for dessert quality; yet their value as commercial apples is indisputable, and they are as extensively planted (in some sections, at least) as any varieties on the list. This shows that high dessert quality is not and ought not to be the only standard by which apples are rated "good" or "poor."

Surely it is no more right to condemn the Russian apples as being "very poor" because some of the largest and best known among them belong to the class of culinary apples, than it would be to call all American varieties "very poor" because some of the leading and best known sorts, such as those named above, or others that might be added, are not dessert fruit. Much the larger part of the apples grown in this and other countries is devoted to culinary use. This seems to be forgotten by a large number of writers on fruit, but surely it ought not to be.

In regard to more recently introduced Russian apples it must be said, and borne in mind, that very few of them have had that wide and general testing, without which all pronounced opinion in regard to quality must be looked upon as a "snap judgment." A public official, above all, should beware of anything like the expression of a hasty and immature opinion on subjects of importance specially committed to his charge.

Of the 250 named varieties of Russian Apples that have been brought into this country within the last twenty years, I know no man who can say that he has ever had an opportunity of fairly testing as many as fifty. My own list covers but forty-two varieties, on which I have had more or less fruit. I am

in my sixty-third year, and have been familiar with the apples of New England, the Ohio Valley, the St. Lawrence and Champlain Valleys, and of New York, from my youth; yet I feel no hesitation in saying that the Russian Apples in my orchard are not inferior in size, beauty, productiveness and vigor to the native varieties of any of these sections. They have, indeed, formed the finest and most attractive part of exhibits where they have competed with our native apples, or with the best known apples of western Europe that are grown in America.

As to the quality of these apples as a class, there are but two, possibly three, of mine that I would rate as very poor—or, to be more precise, as poor as the Ben Davis, when grown in New England. These are Green Crimean, the Spreading Pipka and the Yellow Arcadian. In the class of useful culinary Apples the Russian list is rich, and many of these are fully equal to any American or west European apples that I am acquainted with. We have no better market apples of this class for good flavor, easy cooking, salableness or productiveness than the best Russians, of which Red Astrachan, Oldenburgh and Alexander are well known types.

Of strictly dessert apples I have not yet found among the Russians many of the very highest type equal to Garden Royal, Hunt Russet, Grimes' Golden or Peck's Pleasant. But in a class just below these there is a considerable list, increasing rapidly now as the later importations come into bearing. I class as "very good" dessert apples the Yellow Transparent, Switzer, Longfield, Golden White, Autumn Streaked, Zolotoreff, Titus, Popoff and Prolific Sweeting, and these are not only very good, but they are also large, productive and attractive—some of them strikingly beautiful.

The strongest indictment against the Russian Apples, so far, has been the lack of long keepers among them. The earlier importations had hardly any of these, and we are but just beginning to find them among those now coming into bearing of the more recent ones. The fruit-growers of the "cold north" may rest assured that there are good keeping apples among them. This is certain, and also that they are of good to very good quality; but time is required to definitely place them. Though many of us who are trying them have found that the few first fruits of these varieties will keep as well at least as many in the accepted lists of American winter apples, we must have them in quantity, so that they can be handled not as single specimens, but by the barrel and car-load, before their exact status can be assigned them.

I feel sure that when the Russian apples are fairly judged they will make their way easily. No fruit can receive its proper place from a test of specimens sent by mail and cut on arrival, as I suppose has been the case with Mr. Van Deman. There is a time when any fruit is at its best, and eaten too soon or too late it is not possible to rightly know it. Some varieties have a short season as dessert fruit, and this is true not only of summer and fall apples, but of the longer keepers. Jewett's Fine Red, for instance, has a season of less than a month when it is really fine; and all fruit-growers can name other sorts of which the same may be said. There is also a vast difference in the quality of the same variety, according to how it is grown and handled. Some choice sorts never show their merits in the hands of careless persons. The Roxbury Russet is hardly "good" at any time during its long period when undersized or grown on unsuitable soil. But I have eaten these great Russets in May and June that were grown on the red iron soil of some of the Maine hills, when it was a full match for Mr. Van Deman's favorite, Grimes' Golden. It may thus be pronounced "very good" or "very poor," according to circumstances, and the same is true of many of the condemned Russians.

Newport, Vt.

T. H. Hoskins.

Effect of Forest-Management on Orchards.

MR. FERNOW'S treatment of this subject from the point of view of an entomologist (see p. 462) suggests a paragraph on the relations between the wood-lot and the orchard from the botanical side of the question. The intimate relationship between the Cedar and the Apple-tree was illustrated during the present summer. There were complaints of a serious rust in a large Apple-orchard near Titusville, Mercer County, New Jersey, and in July I found the orchard, which occupies a hill-side, so conspicuously colored by the rust that it was the subject of remark by passengers upon the railroad trains. Not all the trees were equally attacked. The variety known as the Nero was the worst, while some other sorts at that time were nearly free from the rust. In several trees there were two or more kinds of fruit, and one might be rusted badly and the other nearly free.

The orchard is bordered upon two sides by woods containing many Red Cedars. It was evident that the "Neros" were the most rusted upon the side of the orchard next to the Cedar-trees. Two months later the leaves were nearly all off of the "Nero" trees, and while the trees had set full there was no fruit. The other sorts in the orchard had also suffered badly from the rust, but it was later in developing upon them.

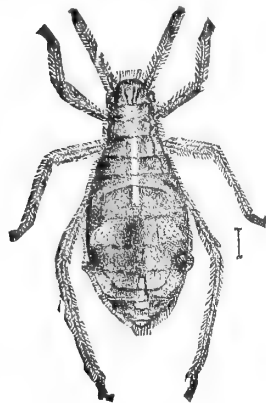


Fig. 60. Oviparous Female.

illustration of the intimate relationship in one particular of the forest and the orchard.

The mismanagement in this case consists in permitting the Cedar-trees to stand hard by the orchard, as living propagating-beds of a Fungus which in one of its forms may be of serious injury to the Apple-orchard.

The relation of the Black Knot of the wild Cherry-trees to the cultivated sorts is an instance similar to that of the Apple and Cedar, with the difference that the Fungus runs its whole course upon the same tree, and the wild Cherries simply furnish a constant supply of spores to infest any cultivated Cherry-tree that may be planted near by. The knots appear only when spores have come from some previously infested branch. It is a piece of folly to attempt the growing of Cherries in close proximity to wild plants that are full of knots. What has been said of the Cherries applies equally to the Plums, for these being closely related to the Cherries are attacked by the same knot-producing Fungus. If we are to have clean and healthy Cherry and Plum-trees in our orchards we must go through the wood-lot with the axe in search for all the wild sorts that bear the Black Knot.

The same close relationship exists between the wild Black-berry and Raspberry and those under culture. The rust of the one will spread to the other, and probably the same is true of the Anthracnose that has been so destructive to the cultivated Raspberry during the past year.

Rutgers College.

Byron D. Halsted.

The White Pine Louse.

THIS insect was first described by Dr. Asa Fitch, in one of his reports on the insects of New York, as *Lachnus Strobi*. Colonies of the plant-lice are said to live upon the ends of the branches of White Pine, puncturing the twigs and extracting the sap, and causing the bark of infested trees to have a peculiar black appearance. Mention is also made of the

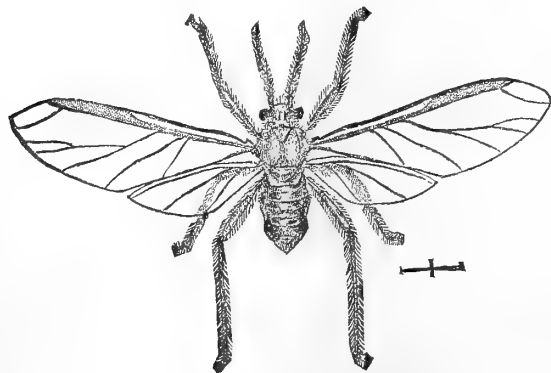


Fig. 61. Winged Male.

fact that numbers of ants occur in company with the lice, "traveling up and down the trees which they inhabit."

Very little has since been written concerning this insect. It appears to be a widely distributed species, and from its winter habit it is evident that it is liable to be introduced everywhere with Pine-trees from nurseries. In central Ohio it occasionally becomes sufficiently numerous to seriously injure ornamental Pines. One tree on the University campus here is now almost dead because of its attack.

Like most plant-lice, this species reproduces viviparously during the summer, but on the approach of cold weather the sexed individuals are produced. During October these are usually the only forms present, the oviparous females being congregated in great numbers upon the bark of the smaller branches, with their heads nearly always directed toward the trunk of the tree. When disturbed they move about rapidly, usually attempting to conceal themselves on the other side of the branch. At such times they also have a curious habit of waving their long hind-legs in the air, probably for the purpose of frightening away enemies.

The oviparous female is represented, magnified, at Fig. 60. It is about .1576 of an inch long, shining black, more or less tinged with brown, and ornamented with spots and stripes of white, as represented in the illustration. The winged male is also shown magnified at Fig. 61. The body is .1788 of an inch long, and the wings expand about .2758 of an inch. The insect is blackish, with a slight glaucous bloom, and a white longitudinal line along the middle of the back.

The eggs are deposited during October and November on the leaflets in rows, as represented in Fig. 62 (a). Each egg is .0788 of an inch long, elongato-oval, brownish when first laid, but becoming black in a short time.



Fig. 62.—a, EGGS ON LEAF; b, EGG, MAGNIFIED.

One of the best remedies for this pest is kerosene emulsion. There are also many natural enemies that keep it in check.

Ohio Experiment Station.

Clarence M. Weed.

New or Little Known Plants.

Leucophyllum Texanum.

LEUCOPHYLLUM is a small Mexican genus representing a tribe in the great family of the Figworts or *Scrophulariaceae*. Its near relatives botanically in our flora are the Mulleins, the Figworts, the Snapdragons, and other familiar plants of the field and garden. The Leucophyllums, of which three or four species are distinguished, are low, intricately branched shrubs, inhabitants of the desert, and distinguished by the silvery white wool which covers the lower surface of the leaves, and by the large, showy, axillary flowers. Two species reach the southern borders of Texas, *L. Texanum* and *L. minus*. The former, of which a figure appears on page 489, is a loose-growing shrub of straggling habit, attaining, under favorable conditions, a height of eight or ten feet, although it is rare to find it in Texas more than half that size. There is no shrub of the desert portions of the valley of the lower Rio Grande more generally distributed, and certainly there is not one of them which more delights the traveler in the early spring months, when the large, violet-purple flowers of this plant heighten the effect of its brilliant silvery foliage.

The leaves are half an inch to an inch long, obovate and almost sessile, pale gray on the lower surface like the shoots of the year and silvery white below. The flowers

are an inch or more across when expanded, with lanceolate-oblong calyx-lobes, a campanulate corolla slightly villose on the inner surface, with five rounded, nearly equal lobes, four included stamens and an emarginate stigma. The fruit is a two-valved capsule.

*Leucophyllum Texanum** was discovered many years ago

taken in hand, however, a few years ago by Mr. P. J. Berckmans, of Augusta, Georgia, in whose garden it flowered during the past summer for the first time probably in cultivation; and it is from a specimen of one of the cultivated plants that Mr. Faxon has made the drawing which is reproduced in our illustration.



Fig. 63.—*Leucophyllum Texanum*.—See page 488.

by the Swiss botanist, Berlandier, a pupil and protégé of the elder De Candolle, who early emigrated to Matamoras and first explored the flora of the valley of the lower Rio Grande and of the Mexican Sierra Madre. In spite of its beauty it long escaped the attention of cultivators. It was

*I.—Bentham in De Candolle's "Prod.," x., 344.—Gray, "Bot. Mex. Bound. Surv.," 115; "Syn. Fl. N. Am.," ii., 250.

Leucophyllum Texanum, although, according to Mr. Berckmans, it is difficult to propagate, is so ornamental in foliage and in flower that it will certainly become a popular garden plant wherever the climate is sufficiently dry and warm for its successful cultivation. A more interesting American plant has not flowered for the first time this year in any garden.

C. S. S.

Cultural Department.

Vineyard Notes.

ONE who has a vineyard is always sure of a surprise. After setting it down very positively that a certain variety has certain specific qualities, he is mortified to find that the next year reverses all his experience.

So it is that in 1890 I am quite confounded about several Grapes. Ulster and Vergennes are to be marked up, while Lindley goes down once more. Lady is where it was, the earliest and best; but so poor a bearer as to be useless. Hayes is up another notch, and behaves regularly so well that it seems to deserve the foremost place among delicious, prolific and handsome early white Grapes. Then Diamond, a little later, is first-rate. No disease touches it except anthracnose on the vine. The bunches and berries are both large and fine. It is handsome, prolific, healthy and an acquisition not easily overpraised. Niagara rotted last year, but this year is grand enough to make up. It is not so good a Grape as Diamond or as Hayes, but larger in bunch, and will outbear any Grape unless it be Worden. Empire State is a failure here in all ways. It is not of high quality nor always prolific, and shrivels on the stem after picking. Duchess is fine, but this year failed to fertilize well. Prentiss is good for nothing. Jessica is half seeds, a small bunch, a tepid flavor. Golden Gem is a spicy little affair, but very small. It grows about like Jessica, and a vine grower would get rich on one as soon as on the other. Purity is a really fine, very early Grape, ripening just after Lady. It is handsome and healthy, with a large berry and large bunch. Grein's No. 7 is worthless, a very small berry, without quality and half seeds. Grein's Golden is the handsomest of white Grapes, but has an odd acid flavor. Pocklington is a late white Grape that is admirable when fully ripe. It needs a favorable season. I should place it after Hayes, Diamond and Niagara. But when it ripens it will make with them a splendid quartette. Martha, when thinned in bunches, is a really fine white Grape for everybody. Eldorado is an ideal in quality and bears fairly well, but the bunches are imperfect. The general reports from it are of the same character. This completes the list of white Grapes of prominence except those grown mostly for wine.

Of red Grapes, Brighton fairly heads the list. It is a marvel in quality, a seedling of Iona, which it resembles, very early, ripening, however, all along through September. Enormously prolific, if grown with other Grapes; but if grown alone, it often fails to fertilize its flowers. Gaertner is another red of superior quality. It is noble in bunch, berry and quality, ripening with Hayes just after the earliest Grapes. Salem is better known, but is not quite so good as Gaertner. Lindley and Massasoit are much alike; they often fail to fertilize under the best conditions. In quality they are of the highest, but are too doubtful to be generally planted. Massasoit is the most subject to black rot of all Grapes in my collection. Ulster is a really good Grape, but was sent out so overforced that the spindling vines damaged its reputation. Vergennes is doing better with me each year. Rogers' 30, a pale red, has been one of my favorites; but for two years it has failed to fertilize. Goethe, another Rogers of the pale red sort, is superb in quality if you can ripen it. Iona is perhaps best of all Grapes, but is seldom seen in the vineyard, because too tender. Goethe and Iona are best treated as pets on the south side of the house. Poughkeepsie Red is a solid bunched Delaware; it may be valuable in some localities. Agawam has come to me from reliable growers in two forms, and I think there really are two Agawams settled on the market. The earlier one is very fine, ripening with Gaertner; the late one is neither prolific nor good. Jefferson is food for the gods, but I cannot ripen it well in this section. Woodruff Red is a second-quality Grape, but perfectly healthy, with splendid foliage, a rampant grower, and the bunches are of compact, medium size. It is a good runaway Grape, where people do little in the way of culture and are not over nice about quality. Diana should be grown for a late red, ripening about with Woodruff. The bunch is very fine, and the vine both hardy and prolific. Walter completes my list of noticeable red Grapes, and is very fine. It looks like a large Delaware bunch, and bears well and is hardy.

Of the black Grapes, Worden, by all odds, heads the list. It is a Concord in all a Concord's good qualities, and leaves out the bad ones. It is fit to eat as soon as colored, two weeks ahead of Concord. Herbert, in my judgment, is the best later black. Barry and Wilder are fine. Moore's Early has once or twice given me a good crop, and it is so early as to be very valuable when you get fruit; but it is tricky. August Giant is worthy of mention as a large grape of good quality, a little later than Concord, and an extraordinary grower.

Our list, except for experiment, may be greatly shortened. Take Hayes, Diamond, Niagara for white; Brighton, Gaertner and Delaware for red; Worden and Herbert for black, and then pet Iona and Goethe, and you have ten as good as you need.

There should be a much more liberal planting of Grapes for home use. When only one vine is planted, take Worden. For two, Worden and Niagara.

Clinton, N. Y.

E. P. Powell.

Timely Hints for Fruit Growers.

THOSE persons who are making preparations to plant new fruit gardens or to add to their old ones during the present autumn should remember that there are many old trees which have lost their vigor, and bear reduced crops, with poorer quality. In some cases a more satisfactory result may be obtained by restoring the old trees than by planting new ones, giving immediate and larger crops than the young trees, which require years to come into bearing. There are two means by which old trees may be restored—pruning and enriching cultivation. The pruning must be moderate and judiciously applied, taking out all dead limbs if present, and giving mellow cultivation in connection with manuring, either broadcast over the orchard or in broad circles around the trees as far from the trunk as the height of the tree. Heavy top-dressing with manure will accomplish much even on grass land without cultivation. We have known this treatment, applied to trees which had many dead twigs and branches and had nearly ceased bearing, to restore them to strong and healthy growth, affording crops of fruit, the specimens as large and fine as those growing on young trees. An essential requisite for such success is in undertaking no more than can be accomplished, and not spreading the enriching process over much ground.

Apple-trees require less frequent renewal than some other fruit-trees, and under the best management will grow and bear well in the more eastern states for fifty years or more, and half that period at the west; sometimes they have lived to seventy or eighty years. Those which stand in the corners of cultivated gardens, where they receive all the requirements for good culture, generally outlive all others.

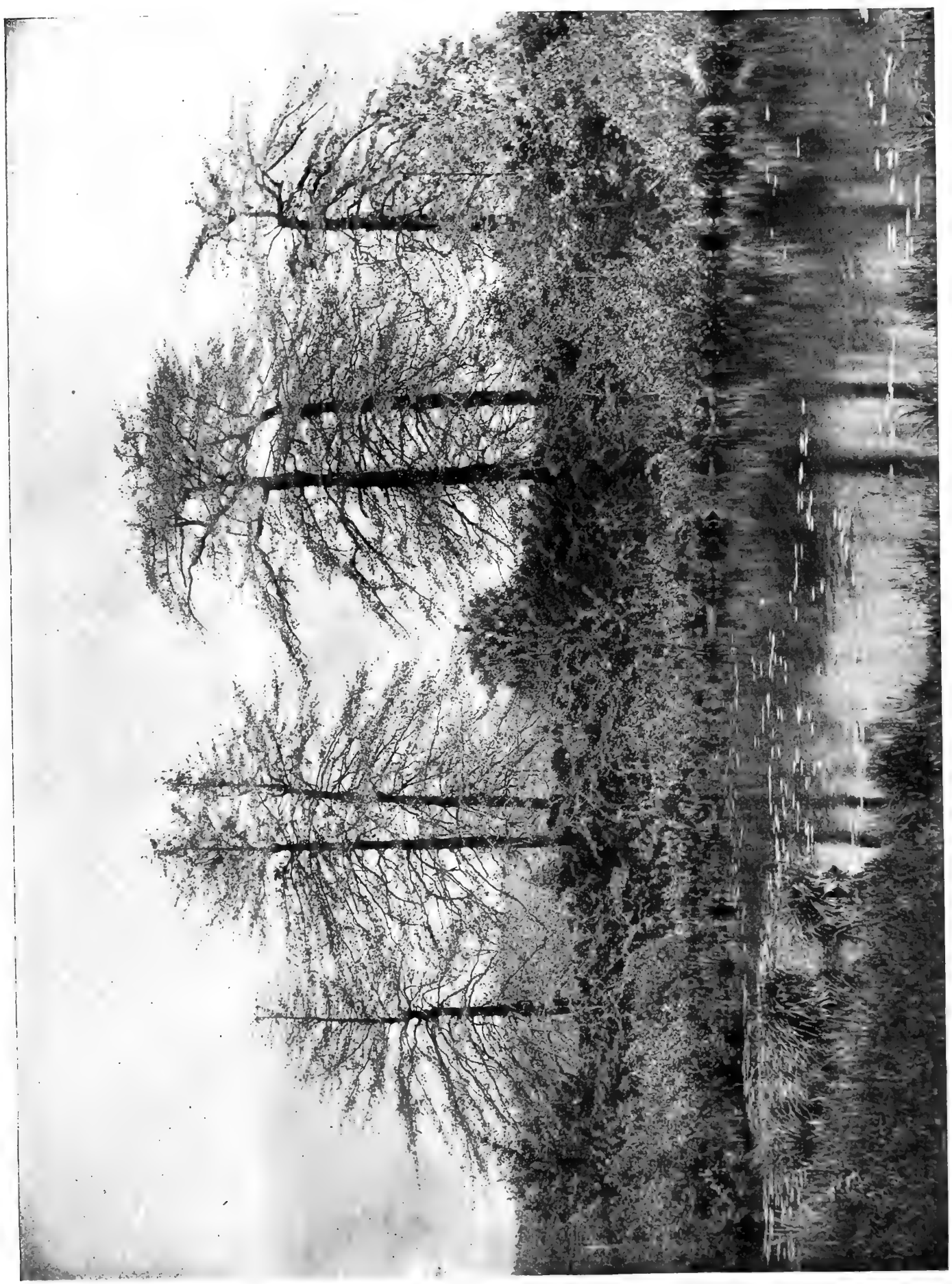
A moderate amount of pruning, especially of dead limbs, may be performed in autumn, but if the trees receive much cutting it makes them more tender for the time, and the work should be left till early spring.

It is often desired to increase and extend old orchards which give fruit for family use, and when this is the case a careful selection of varieties is better than a larger indiscriminate number. A succession, which will afford fruit for the table or for cooking during every day in the year, will be especially valuable. As the earliest fruit continues for a short time only, fewer trees will be required; autumn varieties keep longer, and larger quantities will be needed; while long-keeping winter apples, to supply a period of as many months as the early sorts do for summer, should constitute two-thirds or three-fourths of the whole planting.

The same care must be given in providing a well-prepared piece of ground for other fruits. With Peach-trees clean and mellow cultivation is more important than with most other fruits; while Cherries will endure short grass and moderate fertility. Plums generally do better with rich, cultivated land, and are stunted in grass or in a hard soil and thick crust. A top-dressing with manure on soils where the leaf-blight prevails often prolongs the season of growth; and vigor imparted to Peach-trees early in the season is the best remedy for the curl of the leaf.

As a summary, therefore, or general directions, there are two points to be well borne in mind in planting fruit-trees, whether in autumn or in spring; namely, well prepared, enriched and well cultivated land; and then only as many trees set out as can receive the best attention—selecting those which will afford as nearly a regular succession as practical. Productive varieties will be more profitable in supplying the family than thin and uncertain bearers; and it will cost no more to set such as are of delicious quality than those that are unfit to eat. And the importance of good cultivation must be constantly and at all times remembered, and the great superiority borne in mind of such fruit as comes from well treated trees. A single tree, under the best treatment, may give handsome, juicy, delicious specimens, fit to grace the finest table, and gratify the most refined appetite, and be incomparably better than the product of a dozen neglected trees with their scabby, distorted, insect-bitten specimens and poor flavor. Plant moderately, therefore, and give the most thorough culture, as the cheapest way to obtain full and satisfactory returns.

—The Country Gentleman.



The Tupelo Tree (*Nyssa aquatica*) in Eastern Massachusetts.—See page 485.

Hybrid Violas.

A CORRESPONDENT of the *Gardeners' Chronicle* makes the following notes on these Tufted Pansies, as they have been appropriately called :

These plants are rapidly growing in favor, and for bedding purposes they are invaluable. I know of nothing that can surpass the effect they produce when judiciously planted, and few flowers are more adaptable. Large two or three-year-old clumps of Violas are the most beautiful objects one can have in a garden in May and June, a period when the flowers are most numerous produced.

Amongst sterling new kinds put in commerce this year may be mentioned Duchess of Fife (Baxter), light primrose, distinctly edged with blue, a strong grower and good habit, an improvement on Goldfinch; this novelty will be a leading flower in future years. Ada Adair (Baxter), clear shining rose, dark centre; very pleasing flower, and one of the best twelve. Delicata (Baxter), soft, rosy lilac; quite a new shade, a taking flower, and a very free grower. Crimson King (Baxter), rich crimson, primrose eye, white brows; a finely formed flower, and the best of this shade.

In the list of good but somewhat older kinds, we may name John Burns, rich dark velvet purple, heavily marbled with light peach, white brow, clear eye. Countess of Hopetoun, pure white, compact habit, free bloomer. Holyrood, dark blue, compact habit, extra fine. York and Lancaster, dark purple, beautifully striped with white, shaded with rose; very pretty. The Mearns, rich plum, upper petals edged with white; very attractive. Evelyn, dark blue, shaded white; very fine. Mrs. Baxter, dark purple, with pure white top petals, extra large flower, free habit; best of its class. Sovereign, golden-yellow, compact, immense bloomer. Picturata, mauve; very fine. Neptune, purple, with light back petals. Royalty, bright yellow; first-rate. Columbine, white, margined with rosy-lilac; extra fine. Lucy Ashton, little centre, edged all round with a broad band of rosy pink, after the style of Columbine, but retains its color much better in hot weather; a vigorous grower. Gipsy Queen, very light lilac, heavily streaked with violet; a novel and pretty flower. Hugh Ainslie, top petals bluish mauve, shading to white, under petals rich indigo-purple; clear yellow eye, surmounted with white brows; a large, showy flower and a free bloomer. Mrs. H. Bellamy, upper petals pale lavender, under petals deep solid purple; fine clear yellow eye, with white brows; large, circular and smooth as a show Pansy; a free grower, with a good habit; novel and quite distinct. Marchioness of Tweeddale, pure waxy white, fine habit, first-rate bedder.

Preparation for Winter.

THE present is a busy season of the year to the plant-grower and a press of work now requires immediate attention. One of the first things to be attended to is the housing of tender plants, as sharp frosts may be looked for at any time after the 1st of October. And for this reason it is quite time that Crotons, Aralias, Musas, Pandanus, Ficus, Acalyphas, and all other plants that are easily injured by frost, and that have been in use for bedding, vases and the like, should be brought under shelter. The Crotons should be cut back as they are brought in and potted up into as small pots as possible, and by keeping them a little close for a time they soon recover from the shock.

Some good cuttings are also secured in this way, the young plants from which may be grown on into useful size by the following spring. A few of the Acalyphas, when potted up and placed in a warm house, will yield an abundance of cuttings to supply stock for the following season, for these plants root as easily and quickly as Coleus, and for many purposes are much more effective.

Cannas may remain out-doors until the foliage has been marked by the frost, as one likes to enjoy these noble plants as long as possible, and the first light touch of frost will do no harm to the roots. It is well to save some seed of Cannas and sow it during the winter or early spring, as the seedlings frequently vary considerably from the parent plant. If the seed be selected from some of the improved varieties, it is quite probable that something of value may be secured among the seedlings.

If not already under cover, Carnations for winter blooming should now be lifted, a cloudy day being selected for the operation, if possible. If the plants have a good watering immediately after planting and frequent syringings for a few days they soon recover from the effects of removal.

The staking and tying of the Carnations may be deferred until the more important work of the season is attended to.

Bouvardias, Poinsettias, Heliotropes, Stevias and Eupatoriums will, of course, be under cover before this time, as these useful winter-flowering plants do not improve by being kept out-doors after the nights become cold. In fact, the Poinsettias are quite susceptible to cold, and soon become stunted and lose their lower leaves if they are chilled, and in this case, of course, the bracts produced are inferior in size.

The various bulbs for winter forcing will also be received about this time, or in some cases earlier, and should forthwith be potted or boxed, as the case may be. No time should be lost in potting up bulbs of *Lilium longiflorum*, so that their growth may be made steadily, and without unnecessary forcing, though it should be remembered that if the latter plants are required to be in bloom at Easter calculations must be made accordingly, and it must be borne in mind that next Easter will fall on a much earlier date than the last one. Lily-of-the-Valley, unless specially ordered for early forcing, will probably not be received until the last of October or beginning of November.

Some strong plants of *Deutzia gracilis*, and also some clumps of *Astilbe Japonica*, should be potted, since both these plants are particularly useful for white flowers during the latter part of the winter and early spring; but as both are perfectly hardy, they can, of course, remain in the ground until the more tender plants are disposed of.

Any necessary repairs, such as painting, glazing, etc., that have not been attended to during the summer, should be made at once, because the condensation of moisture on the roof of a greenhouse becomes much greater as the nights get cooler, and it is therefore more difficult to find the roof dry enough for such repairs than it would have been earlier in the season. On an old roof many leaks may be stopped by the application of liquid putty or thick paint with a putty-bulb. It takes but a short time to apply the liquid to each strip on a house 100 feet long, and the escape from drip thus secured is a great comfort for so small an outlay. A good mixture for this purpose is composed of equal portions of white lead and putty, mixed with enough good linseed oil to give the required consistency.

Holmesburg, Pa.

W. H. Taplin.

Spanish and English Iris.—These are the most common of the bulbous section of this genus and are very charming when grown in masses. The flowers have a good range of shades of yellow, bronze, blue and purple, and, being freely produced, the plants are in bloom for several weeks. While the bulb-dealers distribute a fair number of these bulbs every season, they do not seem to survive in gardens, or at least in those in which no care is given to the special requirements of plants. Bulbs of these Irises are hardy in a suitable position, and there should be success in growing them where their requirements are understood. In their native haunts they are subject to extremes of dryness and moisture, so they should be planted in a deep border, where in summer they will receive little or no moisture, and, if possible, a good baking. In winter and spring they will have moisture enough anywhere outside in this climate. Under the south wall of the house is a good position for these bulbs, and in such a place they do well with me, living and flowering freely. There is one point, however, which requires attention: the bulbs must be frequently separated and replanted, certainly as often as every other year; otherwise, as they break up so freely, they will overcrowd each other and starve out. Mr. Orpet's mention of these bulbs led me to look to my stock, and I find that last year's flowering bulbs have each thrown off four or five well developed offsets. These quickly came to flowering size.

Iris reticulata is another hardy bulb which requires a little care in placing, the main point with this being to plant it in a position where it will not start so early that hard frosts and high winds later will cut it off. Its fault is its precocity of bloom. This bulb forces readily, and its Violet-scented flowers are attractive though not very showy. Varieties of *I. reticulata* and allied species are now becoming numerous in cultivation and make interesting groups. Single specimens are not at all conspicuous. It would be interesting to know what proportion of the *I. Susiana* tubers, distributed every year by the bulb dealers, are flowered. This and allied species will by no chance succeed under careless treatment, as will many plants. It is usually recommended that they be planted in late winter in a cold frame. It should be added that in such a position they must have all the air possible. Good success can be had with them by planting in a warm border as late in the year as possible and mulching with six inches or so of

forest leaves. If planted early they quickly start leaves, and hard freezing or high winds are then fatal to their flowering. There is a world of interest in a general collection of hardy bulbs, and they are especially useful in a small garden, often enabling one to practically double crop valuable space.

Montbretia crocosmiæflora, the result of a cross between *Montbretia Pottii* and *Tritonia aurea*, produced by Monsieur Lemoine some ten years ago, has been a valued plant in many gardens since its first introduction, but apparently is not as widely distributed as it should be. Since the introduction of the first hybrid, Monsieur Lemoine has each year offered one or more varieties differing somewhat in the size of individual flowers, but principally in the coloring and markings, in a rather limited range of yellows and brilliant, warm, deep reds and their combinations. The effect of a mass of these flowers in the late summer is very distinct, neat and bright, without glare. In choosing varieties one can scarcely go amiss; the original hybrid being entirely satisfactory—and, of course, obtainable at the lowest price—while the more recent ones are all interesting, though the colors have such a narrow range that at a distance a casual observer would judge them the same; a flower fancier, however, does not collect for the casual observer. Color descriptions are unsatisfactory at best, and it is quite impossible to define shades of red (a color which many people cannot even distinguish), but of a few varieties under trial may be noted: *Pharé*, of a deep flaming orange-red; *Etoile de Feu*, a deeper shade, burnt orange; *Bouquet Parfait*, a slightly different shade of fiery red, and with larger individual flowers. These all have deep yellow eyes. *Elegans* is exceptionally distinct; clear yellow inside and splashed red without. The flowering habit of this variety seems specially graceful. A few others differ much on the same lines, and are all attractive. *Montbretias* need a well drained, deep and moist soil, in which the corms are usually hardy, though not always in this locality. They increase very rapidly, not only by multiplication from the parent, but by pushing out underground stems, from which new plants are rapidly produced. They also seed freely, and from this they will come into bloom in a few months. They are also neat plants for the decoration of the greenhouse in summer, as they grow away freely if not overpotted and bloom for a long season. Individually the flowers are not very lasting, but they are produced in rapid succession.

Elizabeth, N. J.

J. N. G.

Nymphaea Devonensis, though not new, may still be styled a novelty and has a special claim on our attention. While all other Water Lilies, with perhaps the exception of *N. dentata*, are past bloom for the season this is yet blooming freely, and is seen more now than at other times, because the flowers remain open during dull and sunless days while others are closed. This is truly an autumn flowering Water Lily. To prolong the season of this charming plant a shallow tank from twenty to twenty-four inches deep and any convenient size should now be in readiness to protect them in the latitude of New York, and earlier further north. I have nursery tanks twelve feet long, six feet wide and twenty inches deep. Plants grown in tubs and sunk in the Lily-pond are transferred to the tank, and an ordinary garden-frame with sashes can be placed over them. This protection will be sufficient to keep the plants flowering till the end of October. Other varieties can be protected in the same way.

Dongan Hills, Staten Island.

W. Tricker.

Figs in the Open Air.—The growing of Figs without glass in the northern states is not uncommon, and yet it was not until this summer that I saw them so grown for the first time in the gardens of Mr. H. P. McKean, of Germantown, and full of delicious ripe fruit. The only special treatment given in this instance is the burying of the trees when winter comes. The earth is thrown out on one side, the branches are bent over and kept down by stout pegs driven into the ground, and then the earth is thrown back to cover the branches to a depth of about six inches. These trees of Mr. McKean's are now about ten feet in height. On their north-east side a board fence has been erected to keep off cold winds in early spring and to give warmth to induce early growth. It should be borne in mind that they need a sunny place, otherwise some of the fruit will not have time to ripen before cold weather comes. It has been suggested that in planting, the roots should all be spread on one side only, so as to allow of the tops to be bent over in the same direction when the time for covering the tree arrives.

Germantown, Pa.

Joseph Meehan.

Clematis paniculata.—Allow me to add a word on the good qualities of this plant. I assume that it is correctly named,

although this has been disputed. However this may be, it has a vigor of constitution rarely found among Clematises not native. It blooms freely and late, and has a fragrance which resembles that of the Hawthorn as much as anything I can recall. It can be grafted readily on *C. Virginiana*, and also comes here from seed; but this is slow to germinate, although I think seedlings make rather the strongest plants.

Wellesley, Mass.

T. D. Hatfield.

[Not having seen Mr. Hatfield's plants, we cannot be sure of their identity. The note in our last issue referred to a plant which came from the Passaic Nurseries of H. Meyers, successor to Woolson & Co., and it is the true *Clematis paniculata*.—ED.]

Correspondence.

The Condition and Future of the American Forests.

To the Editor of GARDEN AND FOREST:

Sir,—I have never read anything which seems to me more graphic and true, and, at the same time, more lamentable, than the picture painted by Dr. Mayr of the condition of the American forests, and translated in your paper of September 10th. I venture to suggest that your Government, which does a vast amount of public printing, would render a public service by sending a copy of this article to every American citizen; for though it is not always pleasant to hear criticisms from a foreigner, and though it is not always possible for a foreigner to suggest a remedy or to appreciate fully the great difference which exists between the conditions of the American system of self-government and those of older countries, yet this question must be faced and dealt with before long.

The time will come when the names of those persons who have made it the business of their lives to bring home the condition of the national forests to the people will be honored as citizens who have deserved well of their country. The Russians have been described by an eminent German naturalist as "everywhere true wasters and destroyers of forests," but from what little I have seen myself in a single journey of about 10,000 miles through the United States, I do not think they can compare with the Americans; and speaking as an English farmer and as an Indian Tea-planter, who has seen in many parts of Europe and Asia the results of destroying the forests and skinning the land for the sake of a short-lived profit, I do believe that every foot of timber and every bushel of corn or wheat which you are sending us at a ridiculous price, will ultimately cost the American nation much more than their present value. Look at the present state of the forests and the land in many parts of the United States, and see what it will some day cost to restore the soil to a condition in which successful agriculture is possible, and consider what a poor return you are getting for this enormous present waste. What is the value of a few thousand Alaska seal-skins or a few ship-loads of Canadian fish compared to the value of the American public forests? and yet how much do we hear of the former in the debates of your Congress or in the speeches of your public men!

I cannot help thinking that the best possible remedy at present is suggested in your editorial article on "The Army and the Forests," and I can testify from personal experience of the success of this plan in the Yellowstone Park. When the British-Indian Forest Department was first created most of its officers were taken from the army, and though they lacked the technical knowledge, which is now supposed to be all-important, and to be gained only in the forest-schools of France and Germany, they had other qualities which are often wanting in the young men who now recruit the forest-service. For years to come the questions which will be most prominent will not be those requiring technical knowledge so much as common sense, tact and energy in enforcing the regulations which will be made after considering local needs and actual forest-conditions. And above all, you will find among the officers in the army men of such unimpeachable honesty that they will not be open to such criticisms and attacks as were formerly made upon the employees of the Indian agencies, and they will be removed from those political influences which seem to us to play such a prominent part in Government affairs in America.

From a soldier's point of view I would suppose that, considering the great influence upon the character of military operations which the wooded nature of the country has always had in the United States, an intimate knowledge of forest-operations and forest-life would be of more advantage to the American army than to any European troops. We know by experience that the *Ghoorkas*, who are bred and born in

mountain-forests and the best forest-workers we have in India, are also the best soldiers, and that their officers are among the most active and keen hunters in the Indian army. Quartered for the most part in detachments and out-posts on the frontiers, they live under very similar conditions to those which would be endured by detachments of troops engaged in guarding and supervising the state forests in America, and judging from what I have seen in the west I think that soldiers alone would be able to enforce the law in the Rocky Mountains under the existing conditions of society.

But it is not for me to do more than support, by such testimony as I can give, the very urgent nature of the questions which your paper was founded to discuss, and which it has so ably set before the public.

Cirencester, England.

H. J. Elwes.

Naturalization of American Conifers in Belgium.

To the Editor of GARDEN AND FOREST:

Sir.—The experiments which have been made in Belgium in the cultivation of North American conifers have been most successful. Unfortunately, such experiments have been unnecessarily expensive through the difficulty of obtaining good seeds, and I should be glad to establish friendly relations with reliable botanists and lovers of trees in the United States for the purpose of obtaining supplies of coniferous trees and seeds, and it is with this object in view that I address these lines to GARDEN AND FOREST.

We find in Belgium that the Douglas Fir grows most thriftily when it is planted in deep sandy soil in positions where it can be sheltered from severe winds during its early years in order that the shoots which sometimes grow late in the season may not suffer in the cold of exceptional winters. Many Belgian land-owners have planted this tree in large masses, and the way in which the most vigorous specimens here have flourished is exceedingly encouraging. Unfortunately, the young plants found in our nurseries have, in many cases, proved disappointing, and we need to be brought into direct communication with American seedsmen able to supply good seeds at reasonable prices. If this is done, there is hope of making this tree generally known in Belgium.

Abies balsamea is a pyramidal tree here, resembling somewhat the European Silver Fir (*A. pectinata*). It does not, however, attain the same size or live as long. In Belgium it reaches a mean height of forty-eight feet, and is relatively somewhat stunted in comparison with the other species of the genus; nevertheless, on account of its rapid growth in land underlaid with moist gravel, this species is not without value. I know of a plantation at Hastière, near Dinant, which is growing vigorously, and, although the specimens are planted too far apart, the terminal shoots are nearly three feet long, or sometimes more. I have no knowledge of the timber of this species. The straight, slender poles which it furnishes have, however, a considerable value.

A. grandis is a handsome and vigorous tree here, attaining in its native country a height of more than 250 feet, and a trunk diameter of four or five. It grows on flat lands with a humid subsoil and does not flourish in the mountains. The few strong, well grown specimens which I have seen in this country inspire hope of its successful naturalization in our plantations; indeed, the growth of this tree is very vigorous here, the terminal shoots attaining a length of nearly forty inches. Unfortunately, young plants of this species, as is the case with those of the Douglas Fir, are still quoted at such high rates that many planters are deterred from experimenting with them.

The California Mountain Hemlock (*Tsuga Pattoniana*), which attains in its native country a large size, grows at first very slowly in Belgium. When it is ten or fifteen years old, however, the plants begin to increase rapidly, and from that time forward they are very luxuriant, with terminal shoots more than a foot long. This species we find does best on hill-sides where the soil is light and deep. It bears our most severe winters, and, were it not for the scarcity and the high price of the young plants, it would be particularly useful for planting in groups in the sandy hill parts of Belgium.

The White Pine (*Pinus Strobus*) was introduced into France in 1705, and its value as a forest-tree here is now well known; indeed this species, with its luxuriant growth and tall trunk terminated by a majestic crown of foliage, has gained a notable position in our forests. It has the great merit of being able to grow in damp soil. I have seen specimens cut which were nearly eighty years old with a trunk diameter of three feet at the ground. Such trees have found buyers at an average price of \$25.

In those parts of Belgium where the soil is heavy and retains moisture the behavior of this Pine is also satisfactory, equalling that of *Pinus sylvestris*. We do not, however, know of any large plantations, the White Pine being always associated with other conifers such as *Pinus sylvestris*, *Pinus Austriaca* and *Larix Europæa*. It is often planted as an ornamental tree, and when fully exposed to the air and light it grows very rapidly. The wood is highly valued.

Pinus Sabiniana is with us still only an ornamental species; it grows well, but is still difficult to obtain from our nurserymen, and is always high-priced; nevertheless, the few specimens that I know are doing well. This California species should be more generally introduced into our forests.

Thuja gigantea and *Libocedrus decurrens*, both of which produce wood valuable for the cabinet-maker, would find ready buyers at remunerative prices. Unfortunately, they both grow slowly; at least such is the case with trees twenty-five years planted that I know here. They are not, perhaps, in proper soil or sufficiently sheltered. Their height is not more than twenty-five or thirty feet, with a diameter of trunk very large at the base in proportion to the height of the trees.

I believe that they are both valuable trees where time is not an important element, and certainly slowness of growth in a tree should not dissuade wealthy men, who can afford to wait, from experimenting with them. It is true of these California trees, as it is with Oak, the planter must know how to wait.

Nimy, Belgium.

Alfred Wesmael.

An Artificial Garden Effect.

To the Editor of GARDEN AND FOREST:

Sir.—There are growing in this neighborhood a couple of good-sized Beech-trees, which, by reason of their convenient location, are made to support a large double gate and to mark the entrance from a public road to a cultivated field. A number of years ago these trees were subjected to a close and general lopping off of their branches to within six or eight feet of their tops. The result of this operation was that the main stems, which in these instances were rather tall and straight, sent out innumerable sprouts from bottom to top. These new sprouts or branches seem to be of a uniform length of five or six feet, and with their uniformly heavy coat of leaves, form a towering and dense mass of foliage as nearly true and symmetrical in outline as if cut to a model. At a little distance it is suggestive of great masses of vines dependent from the (concealed) limbs of tall stumps. The effect is a most striking one, and can lay claim to elements of beauty essentially its own. But it is in the winter season they present the most remarkable effect. A peculiarity of the new shoots is that they tenaciously hold their leaves, and while the only change in the general aspect is in the coloring, the trees necessarily stand out more prominently and become more marked features in the winter landscape.

The owner's only object doubtless in despoiling those trees was to secure a couple of convenient gate-posts, while he got rid of their offending features in shading valuable ground. But he secured at the same time a unique piece of ornamentation which does not appear in its artificial features inconsistent with the general design of a gate-way entrance to cultivated grounds.

In the facts here given is there not a hint of what might be accomplished in certain possible contingencies in producing garden effects? As when a tree is out of place or is not wanted, or an artificial effect is desired or justified, and especially when it is wanted to produce a winter effect. I have long observed that the second growth of branches, or the shoots which result from a general cutting away of the original branches of certain trees, have a tendency to hold their leaves well on into the winter. It need scarcely be added that none of these new branches or sprouts, by reason of their great number, are likely to develop into large limbs, and therefore the resultant shape of the tree is practically permanent.

Fairview, W. Va.

W. E. Hill.

The Fay Currant.

To the Editor of GARDEN AND FOREST:

Sir.—I observe some discussion in regard to the merit of Fay's Currant as compared with the Versailles. The Cherry and Versailles have been the leading red Currants for years owing to their superiority in size over the Red Dutch, Victoria and other red sorts. The Cherry is notoriously a poor bearer, producing much blind wood—that is, wood without eyes or fruit-buds. This defect seems to vary in the same plants in different seasons, but the fruit is large, handsome and attractive, and it meets with popular favor.

The Versailles produces fruit fully as large as the Cherry, and, I think, sometimes a little better in quality and more of it. Occasionally it carries too much blind wood, and thus demonstrates its nearness of kin to the Cherry; but this is not a serious fault.

The Fay Currant is much more productive than the others; the fruit is quite as large, and the quality is no way inferior. It has the fault, however, of a procumbent tendency. The plants seem determined to develop a trailing habit, very different from that of the erect Versailles. Many of the shoots starting from the base of the plant will run out on the ground and curve up their ends a few inches high, a habit which I dislike very much; and yet I shall set more of them. Of late years we have seldom secured full and perfect clusters of this fruit, because the unfavorable weather at the time of blooming, or some other cause, has prevented the later blossoms from setting. The clusters, therefore, are only about half as long as nature intended them to be. But after all, the Fay seems a great step forward in the development of this fruit, although the ideal Currant has not yet been produced.

Montclair, N. J.

E. Williams.

Recent Publications.

A recent issue of the *Bulletin of Miscellaneous Information* issued by the authorities of the Royal Gardens, Kew, contains an important paper upon the *Fibre Industry at the Bahamas*. It appears from a report of the United States Consul at Nassau, reproduced in the Bulletin, that the progress made in the development of Sisal culture (Sisal hemp being the product of a species of Agave—*A. rigida*, var. *Sisaliana*) during the past twelve months has been marvelous. A year ago there was scarcely a dollar of foreign capital, and very little local capital, invested in this business in the Bahamas, while to-day capitalists from Great Britain, Canada and Newfoundland are buying up Government land by thousands of acres, and are setting to work industriously in clearing and planting as fast as they are able to procure plants for the purpose. Mr. McLain, our Consul, writing on the 20th of January last, reports:

"Small shipments of fibre continue to be made by nearly every steamer, a few old plantings furnishing the material. It is not likely that shipments in any quantity will be possible under two years, but after that time an enormous increase may begin to be looked for, increasing steadily as new fields come into bearing, until the annual exports of the colony, which now average about \$600,000, will leap well up into the millions, as a moment's reflection will show.

"It is a very low estimate to expect half a ton of fibre per acre, and a very low estimate to call it worth \$100 per ton, for it is worth over \$200 per ton in the world's markets to-day. When even the present quantity of land sold and applied for, to wit, 300,000 acres, is bearing, which ought to happen within five or six years, it will produce 150,000 tons a year, worth \$15,000,000, an increase of prosperity that sounds more like a fairy tale than a strong probability deduced from reasonable figures. And yet 300,000 acres is but a small portion of the uncultivated lands within the limits of the Bahamas.

"It is estimated that about 6,000 acres of land have already been planted in Sisal (a plantation once started needs no replanting for many years), and that many additional ones have been cleared and made ready for the plants, the obtaining of which has been almost impossible, the industry being seriously retarded thereby. The prices paid for plants have risen from six cents per dozen to thirty-six cents, so great has been the demand; but the price will now decline rapidly since the supply of plants is developing enormously, about 2,000,000 being now available for planting and others coming on speedily.

"The Pita plant is being found on all the islands growing wild, and the stock of old plants is very great. From the centre of the old plant rises a pole about sixteen feet in length, on the branches of which small plants grow, averaging a thousand to each pole, and from these poles a vast supply is coming into market, creating a profitable business; for what were two years ago only noxious weeds have all at once become worth \$20 apiece for pole plants alone. Quantities of old plants have lately been discovered growing on the keys along the Florida coast, and small schooners are already buying these up and bringing them here for sale. This fact suggests the question whether this new hemp industry, which is about to revolutionize the condition of the Bahamas, may not also be developed in the southern portion of Florida. The plants are found there growing wild just as they are in these islands, and they flourish best in dry, sandy soils fit for little

else. I would earnestly call the attention of the Department of Agriculture to this matter, and suggest the propriety of looking into it, and of calling the notice of the people of Florida to this possible source of wealth and prosperity. The conditions of soil, climate, etc., which make its culture a success here, may not obtain there, but the simple fact that the plant is growing wild in Florida is of itself a consideration that should warrant an investigation at the hands of the Department.

"There can be no doubt or question as to the success of Sisal culture in this colony. It has passed far beyond the experimental stage, and is giving daily evidence that it will become a source of wealth to all concerned. The combined conditions of soil and climate especially adapted to the growth of first-class fibre give this colony a marked advantage over other West Indian islands, where the plant may grow luxuriantly enough, but will be found deficient in good strong fibre. The poorer and more sterile the soil the better the result, and here the plant flourishes where ordinary vegetation seems almost impossible. It is a plant of unfailing growth, it will live without rain to moisten the soil, you can scarcely exterminate it if you try, it requires but little cultivation, and at an expense below that of almost any other agricultural product, and its value is substantial.

"As two-thirds of the trade of the Bahamas is now with the United States; as their only steam communication with the outside world is by a subsidized line of American steamships running between Nassau and New York; as their increased wealth and prosperity means a larger and more profitable commercial intercourse with our own country, we should view this coming development of their material interests with pleasure, and with the warmest wishes for its complete success."

Meetings of Societies.

Horticulture in New Jersey.

THE fifteenth anniversary meeting of the New Jersey Horticultural Society at New Brunswick last week gave occasion for a brief review of the Society's work and history by Secretary Williams, from which it appeared that the horticulture, and especially the fruit production of the state, owe much of their prosperity to the educating influence of this organization. Members of this society have been among the first to make practical use of scientific discoveries in the study of possible remedies for plant diseases and the ravages of insects; some of them have won honorable distinction. On one of the tables there was an exhibition of pears by Mr. White which bore witness to the efficacy of modern treatment against Fungus. One tree which had been left unsprayed lost all its fruit and foliage by Fungus (*Entomosporium maculatum*), while on the trees treated the fruit and foliage was nearly perfect, and they would probably have been quite so if the spraying had not been discontinued so early. These fruits were an object-lesson to all, and they showed the great advance that has been made in spraying compounds and machines.

The only incident that marred the pleasure of the meeting was the resignation of Secretary Williams, who during the entire life of the Society has labored with untiring zeal for its advancement. The continued ill health of Mr. Williams has compelled him to take this step. The regret at his determination was unanimous, and the resignation was referred to the Executive Committee in the hope that when the time for the annual meeting came round in December his health may be sufficiently improved to warrant his remaining in the service. There are few men in the country whose influence has been more widely felt in the direction of improved horticulture and none whose retirement would be more lamented by the horticulturists of the country. Mr. Williams is a man of singularly pure and honest purpose, and he has no superiors in practical knowledge of the particular branches to which his attention has been directed.

Newark, N. J.

J.

Notes.

"*Primula obconica* poisonous" has so frequently been the heading of articles in many horticultural journals, foreign as well as American, that the irritating qualities of the plant may now be considered proved beyond a doubt.

A very beautiful colored plate of *Shortia galacifolia* was issued with *The Garden* for August 30th, accompanied by an abstract of its romantic history, drawn from the longer account which was published in GARDEN AND FOREST nearly two years ago.

Mr. H. B. Ayers reports the discovery of the Hemlock in Section 10, Township 48, Range 16, Carleton County, Minnesota, thus extending the range of this tree further west than it has been before reported, western Wisconsin having up to the time of Mr. Ayers' discovery been considered its western station.

A new Carnation with unusually distinct stripes of red and white has been sent to this office by Messrs. Peter Henderson & Co. It is said to have originated with Mr. George Bergman, of Flatbush, Long Island, as a sport from Portia, which will account for the vividness of the red in its marking. The flower is very fragrant, and it has been christened The American Flag.

The report of the Botanist of the Nebraska State Board of Agriculture, Dr. Charles E. Bessey, is an admirable monograph on the Grasses and forage plants of that state. Mr. Herbert J. Webber, the Assistant Botanist, adds a "Catalogue of the Flora of Nebraska," which is valuable not only for its facts as to the distribution of the Grasses, trees, shrubs and other higher forms of vegetation, but also for its account of the Fungi and other lower plants, many of which are of direct economic interest to man. Of Grasses proper there are enumerated 106 wild species, besides twenty-two which have been introduced purposely or otherwise by man and have subsequently "run wild" to some extent.

The place which Tuberous Begonias have gained in popular favor is shown by the fact that an English journal recently spoke of a nursery garden where about 200,000 of these plants were growing, all this year's seedlings. Although the season has not favored them, the writer says: "There are many superb flowers in the open ground, but it is upon the plants in pots that the grand flowers are to be seen. Among the white and yellow varieties the greatest improvement appears. Plants with a drooping habit, eminently suited for hanging baskets, are here to be seen heavily laden with bloom, whilst the large pot plants exhibit the point which Mr. Laing had before him in the improvement of the Begonia—namely, erect flowers which can be seen without raising them."

Monsieur Carrière describes and illustrates in the September issue of the *Revue Horticole* a new hybrid Rose produced by a gardener near Paris by crossing the Japanese *Rosa rugosa* with the well known Hybrid Perpetual Madame Abel Carrière. This new addition to the Rose garden is described as a vigorous shrub, forming a stout bush five or six feet high by as much in diameter, with handsome dark green, lustrous foliage and flowers produced in large many-flowered corymbs. They are semi-double, with white or pale pink petals, and the curious thing about them is that the petals are conspicuously and deeply notched or fimbriated at the summit, a peculiarity to which the plant owes its name, *Rosa rugosa fimbriata*. It is described as a continuous bloomer, producing flowers from June until October.

The *Revue Horticole* says: "An idea which at first seems bizarre and a little facetious, but is at bottom very sensible, has just been suggested by GARDEN AND FOREST. This is: that hair-pins may be used to fasten to the ground the branches of border plants. The advantages offered by these little instruments, which thus far have had little enough to do with horticulture, are increased by the fact that they are manufactured of different degrees of length and thickness. These new hooks are very strong, and, moreover, very inconspicuous, and modern methods of manufacture render them very cheap." We may add that the neat little bundles in which they are sold seem to make them so convenient to carry, that no gardener need ever be without an immediate remedy for a wayward shoot.

A scheme is afoot for converting the banks of the River Lea into boulevards for the recreation of the inhabitants of East London. It is proposed to acquire strips of land extending for twelve miles and to lay them out as parks, cricket-fields, etc. "The idea," says the *Gardeners' Chronicle*, "is really a somewhat tremendous one, but the most careful inquiry and calculation have led us to the conclusion that it is not only perfectly feasible, but may be carried out to the letter. The advantages to be gained in many ways are simply incalculable. Much of the land is absolutely valueless under the present condition of things. This course, which will unquestionably take effect sooner or later, will not only transform a dull and dangerous part of the country into a series of charming boulevards, but will have the effect of immediately enhancing the value of the property in the vicinity."

In the *Journal of Mycology*, published by the Department of Agriculture, Miss Southworth writes of a new disease of

the Hollyhock quite distinct from the well known Hollyhock disease (*Puccinia Malvacearum*), or from the spot disease described by Professor Halsted in the issue of this journal for March 26th, 1890. The trouble made its appearance five years ago, and has proved so destructive where Hollyhocks are grown for bedding purposes that the price of the plants has quadrupled in New York during the past two years. The Fungus attacks leaf, petiole or main stalk; the flow of sap is stopped and the parts of the plant beyond the diseased portion shrink and die. Treatment with the copper solutions was not completely successful this year; but a thorough spraying with Bordeaux mixture on both sides of the leaves as soon as the young ones appear, and again later, should be tried next season. Of course, all diseased plants should be removed from the green-house, and whenever practicable the plants should be grown out-of-doors.

The death of Miss Marianne North, which occurred recently at her home in Gloucestershire, in England, closes the career of a woman of remarkable energy, courage and perseverance—the greatest traveler of all her sex, perhaps, and a charming and sympathetic personality. Ample means and abundant leisure made Miss North a traveler, and a traveler whose journeys produced visible results, which have served to instruct and delight the world. Long ago she formed the idea of turning her skillful brush to good account, and all her later and most difficult journeys were undertaken for the purpose of transferring to canvas the most remarkable and interesting aspects of the vegetation of the world. To do this she visited the forests of Brazil and California, the mountains of Peru, New Zealand and Australia, the East and West Indies, China and Japan, northern and southern Africa, the Himalayas and wherever else English enterprise had gained a foothold. Such journeys are in themselves difficult, hazardous and fatiguing, and when they are accompanied by the exposure and strain attendant on the labors of an artist painting from nature, often under the most severe conditions of climate and surroundings, they tax the strength of mind and body to the utmost limits of endurance. Four or five years ago Miss North went to Chili for the express purpose of obtaining pictures of the remarkable forests of Araucaria which are found there only on some of the highest mountains. But her constitution, weakened by long residences in the hottest and most unhealthy parts of the world, gave way under this new effort. A long rest in the healthy climate of the mountains of Jamaica failed to restore her wasted energies, and she was forced to give up a proposed visit to Mexico (almost the only part of the world she had not seen) and return to England, which she was not destined to leave again. The enjoyment of her last years, clouded by long and painful illnesses, was found in gardening, to which she became enthusiastically devoted, and which she carried on with great success. Miss North presented her most important works, illustrating various aspects of vegetation, to the British nation. They represent a series of nearly six hundred pictures, which are preserved in the "North Gallery," which she caused to be erected, at her own expense, within the Royal Gardens at Kew, where it forms one of the most instructive and popular departments of that great establishment. Miss North passed a summer in the eastern states many years ago, residing for a considerable time on the north shore of Massachusetts Bay. The friends whom she made in this country at that time, and those who have been fortunate enough to enjoy the hospitality she dispensed so charmingly in London or at her last home at Alderley, remember her with admiration and affection.

Catalogues Received.

F. E. McALLISTER, 22 Dey Street, New York; Bulbs and Seeds.—JOHN GARDINER & Co., 21 North Thirteenth Street, Philadelphia, Pa.; Spring-flowering Bulbs and Roots.—T. S. HUBBARD & Co., Fredonia, N. Y.; Grape Vines and Small Fruits.—F. SANDER & Co., St. Albans, Eng.; Orchids.—HARTMAN MANUFACTURING COMPANY, Beaver Falls, Pa.; Wire Specialties.—WM. PARRY, PAIRY, N. J.; Fruit, Ornamental Trees, etc.—PETER HENDERSON & Co., 35 Cortlandt Street, New York; Autumn Bulbs, Plants and Seeds.—S. C. DE COU, Moorestown, N. J.; Small Fruits and Plants.—VILMORIN-ANDRIEUX & Co., 4 Quai de la Mégisserie, Paris, France; Seeds and Bulbs for Autumn Planting.—JOHN R. & A. MURDOCH, 508 Smithfield Street, Pittsburgh, Pa.; Trees, Bulbs and Flowers.—CURRIE BROTHERS, Milwaukee, Wis.; Flowering Bulbs, Plants, etc.—AUGUST RÖLKER & SONS, Station E, New York; Select Flower Seeds.—SIDNEY TUTTLE & Co., Bloomington, Ill.; Trees, Plants, Shrubs, Roses, Bulbs, etc.—ELI WANGER & BARRY, Rochester, N. Y.; Pot-grown and Layer Strawberries, and Novelties and Specialties for Fall Planting.

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A Park Association.

THIS is peculiarly an age of organization. In nearly every branch of science, of trade, of industry, and even of sport, we have national associations meeting in annual conventions. These associations have, for the most part, proved to be powerful instrumentalities for the promotion of their particular ends. They bring men together for the interchange of ideas upon subjects of mutual interest; they give to men living in widely separated parts of the country the advantage of personal contact with each other, and they provide the opportunity for agreement upon concerted lines of action to forward the ends they have at heart. There is one great popular interest, however, in which, as yet, no steps have been taken toward organization. That is, the important service of public parks. It is time that some action of the kind were taken. The public park movement now extends to nearly all parts of the country, and popular interest in the subject was never before so great. By organization this movement can be greatly assisted, and much can be done toward making the popular interest more active and intelligently effective.

Most of our leading American cities have now important park undertakings in hand, and many of the smaller ones have become alive to the value of public pleasure-grounds, and have taken practical steps to secure them. The formation of a public park association could hardly fail to make this movement still more widespread and to increase the popular interest in the subject. The publication of the proceedings of such an association, and their discussion in the press, would have a marked educational effect upon the people. The true purpose of parks would be more widely comprehended, and the danger of their abuse and maladministration would be correspondingly diminished. The meetings of the association each year, now in this city, now in that, would advance the park interests in the various localities. The several great cities of the country would each desire to be honored with a meeting of the association, and there would be a friendly rivalry among them in the matter of worthy preparation for the event.

Each would desire to have its parks made most attractive for the occasion, special attention would be given to the subject, and the improved aspect of the pleasure-grounds of the city would be likely to be so marked that a subsequent falling off would be more difficult, and the result would be a permanent improvement. A spirit of emulation would also induce cities that had not yet given attention to the subject to undertake the establishment of public parks.

We would, therefore, suggest the formation of an American Public Park Association, to comprise the commissioners, trustees or committees in charge of the public parks and pleasure-grounds of the various cities and towns, also the authorities in charge of national and state parks or reservations, such as the Yellowstone and the Yosemite, the Niagara Falls, and the proposed Adirondack reservations in New York, and the proposed White Mountains reservation in New Hampshire. Organizations like the Massachusetts Trustees of Public Reservations, the proposed body in Massachusetts for the preservation of beautiful and historic places, should also be included, and an indispensable element in the membership would be the landscape-architects or gardeners engaged in park work, and also the superintendents of public parks and pleasure-grounds.

It would be well to make the Association continental, rather than national, in its scope, after the plan of the American Association for the Advancement of Science, the American Forestry Association and other important bodies. It would thus include not only Canada, but also Mexico, for in the latter country the institution of public pleasure-grounds, particularly in the shape of urban gardens, is a universal one, and much could be learned in that quarter. Appropriations from the various municipalities to defray the expenses of officials attending the meetings of the Association would be eminently proper, for the advantages gained from such conferences would return the expenditures manifold.

The meetings of the Association could not fail to be occasions of exceptional interest and enjoyment. They should be held annually in the various large cities of the country where public parks have been established, at some favorable time during the pleasant seasons of the year, ranging from late spring to early autumn. Perhaps, owing to the peculiar nature of the object, it might be well not to have the time for meeting fixed for any special week, or even month, since an examination of the parks of the place of meeting would be one of the features of the occasion, and therefore the time most favorable should be chosen. The time of year which would be most favorable for meeting in a Canadian city, for instance, might be extremely unfavorable in a southern city. It should also be the aim to hold the meetings successively in widely separated portions of the country, in order to make the influence of the Association as extensive as possible, as well as to give an agreeable contrast of environment to the various gatherings.

The subjects for discussion would have a wide range of character and would be practically inexhaustible. They would include questions of the maintenance, the management and the use of parks, and of their adaptability to various purposes. Landscape-gardening, with all its possibilities and limitations, would always furnish themes for discussion. Much information could be imparted and learned by means of lantern-slide exhibitions illustrating notable works completed or in progress. Visits to the parks of the city where the meetings might be held, besides excursions to places of scenic interest in the neighborhood, would all help to make these conventions events of educational value.

The power for good proceeding from such an association would be noteworthy in bringing about better methods of administration, in extending the influence of men who are recognized masters in the art of park design, and in elevating and popularizing the standards of good taste, and in checking meretricious and evil tendencies.

It might also, be desirable to supplement the American Association with minor organizations of a sectional character, as in states like New York and Massachusetts, for instance, where public parks have of late years become numerous. In Massachusetts there are now at least nine cities and towns with boards of park commissioners. Besides the great park system of Boston, the parks of Lynn, Brookline, Worcester and Lowell are undertakings of notable importance. A state park association would therefore be capable of doing much good in the way of forwarding the right kind of legislation and in disseminating enlightened views on the subject.

Names for County Roads.

A SYSTEM of numbering country houses has been started in Contra Costa County, California, which, through the exertions of its originator, Mr. A. L. Bancroft, has attracted comment all over the country. Perhaps the most characteristic feature of this scheme is the so-called "ten-block system," according to which each mile along the various roads of the county is divided into ten equal parts or imaginary sections of 528 feet, and to each block is assigned an even number on one side of the road and an odd number on the other. Any house located within the block bears its number, and where a block contains more than one house these are distinguished by letters. Of course these numbers will indicate the distance from the starting-point, so that there is no trouble in calculating how far any given house or block is from any central point where the numbers begin, as, for example, from the county-seat, and, indeed, from any other point in the county by a given road. Numbers placed at the entrances of the various houses would in this way serve as mile-stones also, and the scheme taken all together contemplates the publication of a county directory on the same plan as that of the city directory.

The need of such an accurate location of one's dwelling place does not seem to be so great in the country as in the city, and perhaps it will be some time before the county directories will become general. But before the roads can be divided into blocks they must be named, and if any system of numbering is to be of benefit to strangers there must be guide-boards containing these names. This naming of the country roads, however, could be adopted in any county, even where the remainder of the organized plan was not adopted. The people of the particular county where this innovation has started have acted with remarkable good taste in the selection of names for their roads, and in an article which appeared in the *Pacific Rural Press* some months ago some admirable directions for naming roads were laid down. Here are some of them: A road should not be named after a residence or the name of a farm on it, since this would not be satisfactory to those whose names were not selected. A road should not be named after either of its termini; for while this might be appropriate in traveling in one direction it would be inappropriate in going in another. Names should be sought among the legends, the historical associations, the botanical characteristics and landscape features of the locality. If it is found difficult to select enough names of this sort good taste would suggest others hardly less appropriate.

In Contra Costa there is a foreign population of some size, and foreign names are used in some cases. The word road is not invariably adopted, but some other equivalent has been substituted. Some of the names selected are here given: The Contra Costa Highway is the road leading from the county-seat through the county; and as this is the only road which is called a highway it will be known as The Highway or the principal road of the county. Rio Vista or River View is the name of the road along the bluff that overhangs the river. Mountain Drive designates the road that leads to the summit of Mount Diablo, and Camino Diablo the one which winds around its base. Via Concordia is a road near the town of Concord. Willow Pass Road runs through the pass so named and extends both

ways. Lime Ridge Crossing is the road which runs over this ridge, connecting two other roads, one on each side. Walnut Way is a road through a region where the native California Walnut-trees are numerous.

These examples show how admirably the work of naming has been done, and if tasteful guide-boards, painted with a light, though not white, background, and a dark border, and lettered with dark brown, are used, the general effect will be very pleasing. The name, however, is the essential point. Sections of the country where every farm and every feature of the land are known by some characteristic and distinctive title are invested with a peculiar interest. No one ever heard the name of the Hawk's-Nest Road, which runs along the brow of the cliff that overhangs the Delaware River above Port Jervis, without a desire to ride over it. And pleasant as is the prospect from Wolf-Pit Hill, looking down "The Clove," in Wantage township, New Jersey, it has an added charm from these names, which were given by the early Dutch settlers of the place.

Jeannette Park, New York.

THE city of New York is not well furnished with small parks, but one of the most interesting of these is illustrated on page 503 of this issue. Although it is in the oldest part of the city, and in a part devoted to the heavy business which naturally establishes itself along the docks, it is a very new park, the space which it occupies having been provided by the filling in of Coenties Slip, which, until a few years ago, extended inland from the river front through the entire depth of the square. Four years ago it was decided by the Park Department to plant the small area which was thus added to the territory of the city, and a plan was prepared by Mr. Samuel Parsons, Jr. As the park is not a thoroughfare, and there is no occasion to cross it in a direction parallel to the river, there are only two entrances, one on the side fronting the river and the other opposite to it. The view, which is taken from the roof of one of the houses facing the park, gives its design as clearly as if it were a map. The area of the park is about two-thirds of an acre, and the plan is simply an exterior border of shrubs, with occasional loose groups and masses of shrubs and herbaceous plants within the path, while at considerable distances apart are planted American Lindens, Elms, some Lombardy Poplars and occasional specimens of the Purple-leaved Plum.

In the older parks this view of the turf from above would not be possible, owing to the spreading tops of the trees. But here the trees have not yet reached a sufficient size to obstruct the sight or to be of any value for shade. It is worth while to note, however, that the only way in which it is practicable to obtain thrifty masses of shrubs among trees is to plant them together, so that they can adjust themselves to each other's company as they grow. After the trees are once established it is almost impossible to induce shrubs to grow in the shade of their branches. The shrubs used here are mainly Bush Honeysuckles, Thunberg's Barberry, Philadelphus, Japanese Snow Ball, Japan Quince, Coral Berry, Weigelia and Japanese Privet. This last plant, although it grows in rather a whippy form, can be kept in good shape by hard pruning, and it endures the trials of city life as well as almost any other. It is largely employed in this park. Besides these, there are some Golden Elders, which have been carefully pruned, and have this year been unusually rich in color.

This little bit of green is particularly cheerful in the closely built business part of the city. Its lines are all graceful; the selection of shrubs is good; the turf is in admirable condition, and as seen every day by the thousands who pass by it on the elevated railway, and get about the same view as the one in our illustration, with the busy river beyond and the Heights of Brooklyn in the misty distance, it is a pleasing and refreshing picture. It is a matter of complaint by the boys that they cannot play base ball in Jeannette Park; but it is an unfailing delight to their smaller brothers and sisters, and in summer evenings it is

filled with people who live in the few flat-houses in the vicinity and in the upper stories of the warehouses and business buildings. It should be added perhaps that in the perspective the true shape of the park is hardly apparent. It is nearly twice as wide at the side next to the river as it is on the opposite side, and no two of its boundary lines are parallel.

A Japanese Floral Calendar.

IF a visitor to the City of Tokio should walk up along the Sumida River he would find upon the bank a noted garden which is known here by the name of Hanayashiki, which means in the Japanese language The Garden. To one who enters there to sip a cup of tea a little maid will present a printed list of flowers classified in the order of the months, and it will be found that the list is adapted to the Chinese calendar as most of our garden plants and our art of gardening were derived from China. The first month of the Chinese, which is the Japanese horticultural and floral January, begins about the middle of February in our modern calendar, and so on during the course of the year, and readers will understand that the first month on the list means February, and that the February of the horticultural calendar means actually March. Here are the seven chosen herbs of January: (1) Seri, *Cenanthus stolonifera*; (2) Nadzuna, *Capsella Bursa-Pastoris*; (3) Hakobe, *Stellaria media*; (4) Suzushiro, *Arabis flagellora*; (5) Hotokenoza, *Lamium amplexicaule*; (6) Suzuna; (7) Gogiyo.

These are the flowers of spring, the seven herbs being the earliest growth after the severe cold and deep frost of the winter. In the garden named above in the spring we can call for the soup of the season, which contains all these herbs. In a well ordered family the good housewife would prepare water with Nadzuna in it, and in this water the members of the family would dip the tips of their fingers before they pared their nails, which have been allowed to grow since December. This custom, however, is becoming obsolete.

After February, when the days become longer, the most popular flower is *Prunus Mume* (the Mume of the Japanese), which is generally cultivated throughout the empire both for its flowers and its fruit. The beauty and fragrance of its rich varieties are indeed worthy of admiration. It is often kept in a dwarf condition, and under this treatment is suitable for pot-culture on the porches or verandas. With it is found the indispensable and beautiful yellow *Adonis Amurensis* (the Fukujiso of the Japanese). The fruits of this tree make a very useful condiment, and its acid is extensively used for dyeing and other industries. The early Cherry, *Prunus subhirtella* (Higansakura), with its later varieties, blossoms in March, at which time the whole country is gay with merrymaking and excursions, and people of every class and age go out to enjoy the splendid display which Nature makes. Hundreds of people now repose on the smooth turf; and the soft sunshine and genial air are excelled in no other holidays of the year. In Japan the fruits of this Cherry are not cared for, but the flowers only.

On the eighty-eighth night after the 1st of January farmers rouse themselves from their winter confinement and leisure and begin to sow seeds in the fields and make beds in the gardens for their new plants. The Nashi (*Pyrus Ussuriensis*) is now in full blossom, followed by the famous Botan (*Paeonia Moutan*), which is well known in foreign lands, and in which we take a pride second only to that which we feel in the Chrysanthemum. Flower shows are held all over the country during this season. Less widely known than the former, and yet a general favorite here, is Shakuyaku (*Paeonia albiflora*), which has been favored by Nature with an air of gaiety beyond that of any of her floral companions. In one of our well known verses it is said:

"Slender and shy like Shakuyaku when she stands;
Beautiful and dignified like Botan when she sits;
As stately and gentle as Yuri (Lily) in her bearing when she walks;
These graces I hope for in her."

Sendan (*Melia Japonica*) and Unohana (*Deutzia Sieboldiana*) are not so attractive as the plants already mentioned, but the latter is used by good women in their celebration of Buddha's birthday on the 8th of April just as the Holly is among Christians.

At the end of May comes what we call the "Little Summer," really the approach to summer, when the Hanashobu (*Iris laevigata*) and Nemunohana (*Albizia Julibrissin*) are in bloom. Then comes Asagao, which means, in the Japanese language, Morning Face, as you say in English, Morning Glory (*Ipomoea hederacea*), to which special attention is paid by the

park gardeners of Tokio; and along the moat around the old castle of Tokio the morning walk is made beautiful by the blooms of Hasu (*Nelumbium speciosum*). *Scirpus maritimus* is another famous plant of the season, and in July, when the morning fogs leave dewdrops on the wayside grass, the *Lespedeza bicolor* in its varieties, some violet and others white, is abundant everywhere.

July and August are the most important floral months, and altogether the richest in the calendar in Japanese flowers. Here is a set of seven, which is usually offered on the festival of the Milky Way held on the 7th of July: (1) Senno, *Lycnis Senno*; (2) Hayakiku, Early Chrysanthemum; (3) Kikiyo, *Platycodon glandiflorum*; (4) Ominaeshi, *Patrinia scabiofolia*; (5) Hasu, *Nelumbium speciosum*; (6) Oguruma, *Inula Britannica*; (7) Shimagaya, *Phalaris arundinacea*. Another collection for August is very useful and popular, in which we find two or three of the plants included in the last set: (1) Karukaya, *Anthisderia arguens*; (2) Kikiyo, *Platycodon glandiflorum*; (3) Ominaeshi, *Patrinia scabiofolia*; (4) Hagi, *Lespedeza bicolor*; (5) Shiwon, *Aster Tartaricus*; (6) Fujibakama, *Eupatorium Chinese*; (7) Kudzu, *Pueraria Thunbergiana*. But there are often arbitrary amateurs who discard *Pueraria Thunbergiana*, and even *Aster Tartaricus*, for *Ipomoea hederacea*. The list we have made is the one popularly followed. The plants are generally grown together, not in regular rows, however, but in apparent confusion, so as to bring out their harmonies and diversities as in their wild state.

Two weeks ago I went for a trip to the north, and found some of these flowers growing in Nasuno, one hundred miles from Tokio, on the way from Nikko to Shiobara, in their finest natural forms.

September is the month of the Chrysanthemum, and exhibitions of these are held in various places. One of the largest and finest is in His Imperial Majesty's detached garden at Aoyama, Tokio. But it is impossible to give any idea of the abundance and beauty of our national flower at this season.

In October comes the early frost, when the leaves begin to change their color and thus invest the mountains beyond the suburbs of the city with new beauty. The trees are chiefly Momidji (*Acer palmatum*) and its varieties, Urushi (*Rhus vernicifera*) and *Ginkgo biloba*, with which the Japanese floral year is concluded.

In the two months which follow *Pinus densiflora* (Akamatsu), *Thalictrum aquilegifolium* (Kamakurahiba) and similar evergreens rule in the gardens of the country whose people cannot do without them at any season. Indeed, this rich and fertile empire is ever green with foliage, and the happy mountains and valleys have a smile for visitors even in the middle of our hard December.

Of course, what I have written is not meant as a list of the plants available for garden purposes in Japan, but simply a catalogue of those which are kept in Hanayashiki for the purpose of indicating the respective seasons. Besides these, we have special exhibitions of Camellias, Wistarias and Azaleas at various places, of which I hope for an opportunity to describe later.

Agricultural College, Tokio, Japan.

H. Yoshida.

Nematodes in the Chrysanthemum.

COMPLAINTS of sick Chrysanthemums have been so loud and general this autumn that a microscopic inspection of the trouble has been undertaken. The plants fail to make any adequate growth, the lower leaves turn brown and dry up, and soon the diseased plant is uprooted and replaced by another, which in its turn dies after the same fashion. With the hand lens no signs of insects were to be seen and no form of mildew or rust was found. But when the leaves in the first stages of the trouble were torn to pieces with a needle and forceps in water it was found that all the pulpy portion was infested with minute worms. They were found of various sizes and ages and in great numbers. Upon examining the dead portions of the plant the remains of these same worms were detected in all stages of decay.

The species is a Nematode which seems to be the same as that which was found on Violets last winter, and also at the present time, as some growers have recently reported. In the cultivated Violet the worms are practically confined to the roots, where they produce galls in considerable numbers, easily seen with the naked eye. *Heterodermia radiculicola* is charged with preying upon a large list of cultivated as well as wild plants, but the works upon the subject do not mention the garden Chrysanthemum among the victims. If the Nematode in question is the same as that now well known upon the Violet it suggests that these two plants

should be kept at some distance from each other, or, at least, that earth once used for Violets should not be employed afterward for Chrysanthemums. Remedies for the Chrysanthemum Nematodes do not seem easy of application. A leaf, for example, that has lost its green color, and is passing through various shades of yellow to brown, may be alive with worms, but they are out of the reach of any external application, while lime or lime-water applied at the roots does not reach the place where they are most active.

Of course the leaves should all be removed and burned, and so should whole plants when too far gone to be worthy of more attention. If the dying leaves are left to fall and drift into hot-beds, cold-frames and other places they may do much to spread a serious trouble.

Rutgers College.

Byron D. Halsted.

Plant Notes.

Some Recent Portraits.

THE *Gardeners' Chronicle* of September 20th contains a figure of a new *Masdevallia*, for which Mr. Rolfe proposes the name of *M. fulvescens*. It is a native of New Granada, whence it has been imported by F. Horsman & Co. It is related to *M. infracta*, but surpasses that species in the brighter coloring of the perianth, which is described as "of a light buff shade, passing into light purple-brown on the constricted sides of the throat, the upper sepal deeper orange-yellow, shading into purple-brown on the two lateral nerves."

A colored portrait of a flowering branch of one of the double-flowered forms of the Japanese Cherry, *Prunus Pseudo-Cerasus*, is the principal illustration in the issue of the *Garden of London* for September 20th. It well represents one of the most beautiful flowered of all small hardy trees. A number of forms occur in cultivation, one of the most attractive being that generally known as *P. Watereri*, in which the flowers are delicately shaded with pink. The single-flowered form of this tree is much less common in cultivation than the double-flowered garden-varieties, and is less vigorous as it appears in this country and not always perfectly hardy.

A recent portrait of *Staphylea Colchica* in the Bulletin of the Royal Tuscan Society of Horticulture reminds us of the great value of this shrub as an ornamental plant. It is by far the most beautiful of all the genus, and well worth a place in the shrubbery. Moreover, it forces well, and of late years it has been very largely used in both Paris and London for supplying the winter markets with fragrant white flowers.

New or Little Known Plants.

Gerbera Jamesoni.*

THE genus *Gerbera* is composed of about twenty species, most of them natives of South Africa. The one figured on page 501 appears to be the first introduced into gardens, having flowered for the first time in the spring of last year at Kew, when it was figured and described in the *Botanical Magazine*. In habit it is quite distinct, and its flowers are so large, so attractive in color and so lasting that it is certain to become popular with cultivators. Plants of it have flowered at Kew all through the present summer and are in flower still. They are grown in pots in a cool, sunny greenhouse, and are planted in a mixture of loam, peat and sand, and kept moderately moist. Last year a plant was tried in a sunny border out-of-doors, where it grew well and flowered all through the summer and autumn. During the winter it was protected by a slight covering of coal-ashes, but, in spite of this, the frost killed it. Except, therefore, in places more favored than the neighborhood of London, this plant is not likely to prove hardy. In pots, however, it is perfectly satisfactory. Hitherto no seeds have been matured by cultivated plants, the only means of multiplying them being by dividing the woody root-stock whenever a second growth appears. The plant is described by Sir Joseph Hooker as follows:

"All parts covered with soft hairs, and the mature leaves clothed beneath with a snow-white tomentum. Leaves numerous from the perennial root-stock, petiole six to eight inches, erect; blade five to ten inches long by two to three

inches broad, runcinately pinnatifid, with the margins of the lobes undulate and cut into unequally sinuately toothed obtuse or acute lobules. Scapes ten to eighteen inches long, stout, naked. Head solitary, sub-erect, three to four inches broad across the rays. Involucre three-quarters of an inch long, campanulate, woolly, base intruded; bracts lanceolate, appressed. Flowers of the ray in one series, about thirty, narrowly ligulate, three-toothed, dull yellow beneath, bright orange or flame-colored above; . . . disc-flowers minute, of the same color as the ray-flowers."

To this it may be added that the leaves are evergreen, the flowers are rather nodding than otherwise, and they are open all day whether it be sunny or clouded. Each one lasts several weeks, and the color never loses its brightness and intensity.

This species was discovered in the Transvaal, near Barberton, now famous for its gold mines, and sent to Kew by the Curator of the Natal Botanic Gardens in 1888. Since then several other species of *Gerbera* have been procured from the same region, and these, judging from dried specimens, are likely to prove as valuable in horticulture as that here figured.

Kew.

W. Watson.

New Orchids.

MASDEVALLIA GUTTULATA, Rolfe, is an interesting little *Masdevallia* which has been in cultivation for some considerable time. The native country is unknown. It has flowered in the Glasnevin Botanic Garden and also at Kew. It belongs to the *Tovarensis* group, having triquetrous peduncles, which bear two or three flowers in succession. They are about half the size of those of *M. Tovarensis*, yellowish white in color, spotted and slightly suffused with light purple. The name is given in allusion to the numerous small spots.—*Gardeners' Chronicle*, September 6th, p. 267.

CYPRIPEDIUM × ALFRED, N. E. Br., is a hybrid raised in the collection of Mr. D. O. Drewett, of Mill-on-Tyne, from *Cypripedium venustum* fertilized with the pollen of *C. Philippinense*. It is quite intermediate in character between its parents. The scape is single flowered at present. The sepals and petals approach *C. Philippinense* in shape, while the lip is more like that of *C. venustum*. It was awarded a first-class Certificate by the Royal Horticultural Society on August 26th last.—*Gardeners' Chronicle*, August 30th, p. 252; September 13th, p. 294.

CYPRIPEDIUM × ALICE, N. E. Br., was also raised in the same collection as the preceding, from *C. Stonei*, fertilized with the pollen of *C. Spicerianum*. It strongly resembles the last named species in shape, except the lip, which is more like that of *C. Stonei*. The scape bears two flowers, which are pale and delicately colored.—*Gardeners' Chronicle*, August 30th, p. 252; September 13th, p. 294.

CYPRIPEDIUM × CONSTANCE, N. E. Br., is another hybrid raised in the same collection as the two preceding, from *C. Stonei*, fertilized from the pollen of *C. Curtisii*. It is intermediate in character between the parents, with the lip approaching *C. Stonei* in shape. The sepals are milk-white tinged and nerved with purple, and the petals pale yellowish with numerous small purple-brown spots. The scape is two-flowered.—*Gardeners' Chronicle*, August 30th, p. 252; September 13th, p. 294.

Kew.

R. A. Rolfe.

Foreign Correspondence.

London Letter.

DAHLIAS.—A great show and a special conference of Dahlias and Dahlia-growers were held at Chiswick last Tuesday. The flowers were as good, as numerous and as varied as might be expected in a country where the Dahlia has been more or less a popular garden-flower since the beginning of the present century. Mr. Shirley Hibberd opened the conference with a most interesting extempore discourse on the origin of the Florists' Dahlia. He startled the botanists by declaring that in his opinion there was no good ground for admitting more than one original species, namely, *D. variabilis*, the other five or six recognized by botanists being at most mere wild forms of that plant. Mr. Hibberd is probably right; but the same line of argument would, if followed, inevitably lead to the wholesale reduction in the number of species of tuberous Begonias, Rhododendrons, in fact of almost all genera which have discovered an extraordinary proneness to vary under cultivation. Although there is proof that the plants now known as Dahlias

*Bolus; Hook. f. *Bot. Mag.*, t. 7087.



Fig. 64.—*Gerbera Jamesoni* (reduced one-third).—See page 500.

were known to Hernandez in 1615 it was not until the year 1789 that the plant was introduced from Mexico, by means of seeds, to the Botanic Garden at Madrid. A few of these seeds were secured by Lord Bute and sent to England, where they flowered in 1790. The plants were, however, soon lost, owing to the mistaken idea that they required stove treatment. About this time this species received the name of *Dahlia coccinea*, the generic name being a compliment to the botanist, Andreas Dahl. According to Salisbury a second species, *D. variabilis*, was introduced in 1804 by Lady Holland, who sent the seeds from Madrid. Its behavior under cultivation is delightfully described by Salisbury in his paper read before the Horticultural Society in 1808 and printed in the first volume of the Transactions. The names he uses are: *D. sambucifolia* for *D. variabilis* and *D. bidentifolia* for what is now called *D. coccinea*.

The work of the florists began in 1813 in the Botanical Garden at Louvain, where a series of double-flowered forms were raised by Donkelaar. In England the Dahlia appears to have reached the height of its popularity about 1850, after which it began to decline until the founding of the Dahlia Society in 1870, which brought about a revival of the Dahlia amongst popular garden-flowers. In 1872 an additional interest and value were given to Dahlias by the introduction of *D. Juarezii*, the Cactus Dahlia. It was obtained by accident, so it is reported, from Mexico by a Dutch nurseryman, with whom it flowered in 1874. Two or three years afterward it was in the possession of the enterprising Mr. Cannell, who showed flowers of it at one of the horticultural meetings. It is probably of hybrid origin, or, at any rate, the production of the garden rather than of nature. There are now many varieties and crosses between it and the show Dahlias, but few of them, if any, surpass it either in brilliancy of color or in shape. *D. coccinea* has flowers three inches across, with a large yellow disk surrounded by a single row of scarlet, oblong ray-florets. *D. variabilis*, in some of its forms, is not unlike *D. coccinea*, but it shows considerable variety in the size and form of its flowers even in a wild state. Other species which have recently been used by breeders of Dahlias are *D. Merckii* (*D. glabrata*) and *D. gracilis*. The characters of these four are traceable in the single Dahlias of to-day.

It is recorded in the *Floricultural Cabinet* for 1858 that a figure of a distinctly double Dahlia occurs in an old work on the natural history of Mexico published at Rome in 1651. So far, however, as the double Dahlias of European gardens except *D. Juarezii* and its forms are concerned, they appear to have been first bred by Donkelaar, as above stated. The single Dahlia has only recently found favor in gardens. The sole object of the breeders of these plants in the old days was, no doubt, to get away from the single flowered varieties as far as possible. Within the last ten years or so all this has been changed, and now for every one who admires and grows the double flowered varieties there are twenty who prefer the single ones.

I have only recently noticed some of the most striking of the Dahlias grown in England at the present time. The following were awarded certificates by the Floral Committee:

- Eldorado (Show), very full, deep crimson in color.
- Othello (Pompon), a medium-sized flower, colored bright crimson.
- Mikado (Pompon), a small flowered kind, white edged with crimson.
- Comedian (Fancy), dull orange, striped and flaked with crimson and edged with purple.
- Beauty of Arundel (Cactus), crimson with maroon edges, a good, bold flower of attractive colors.
- Centennial, a large double flower, colored magenta, with deep crimson edges.
- Melita (Pompon-Cactus), small flowers, with the florets pointed as in *Juarezii*, crimson tipped with white.
- Yellow A. W. Tait (decorative), a bright, clear, yellow flower of special value as an effective border plant.
- Daisy (Pompon), yellow, with deeper shade on tips of petals.

GRAPES.—An exhibition of grapes was held at the same time with the Dahlias, and a conference of growers on the day following that given up to the Dahlia fanciers. There was a fair display of fruit, but, probably owing to the absence of a prize list, there were fewer exhibitors than might have been expected. The conference was remarkable for a paper on "The Enemies of the Vine," read by Mr. R. D. Blackmore, the eminent novelist, author of "Lorna Doone" and a market gardener besides. Mr. Blackmore deals with all the pests, insect and other, of the Vine except Phylloxera. This scourge is known to be present in more than one collection of Vines in England. So far the only really effectual remedy appears to be grafting as practiced in France, especially in Bordeaux. The stocks employed are the American Vines known as Jacquez and Herbemont and the variety *riparia* of *V. cordifolia*. Upon these the best French kinds are grafted, with, so far, perfect success—the stocks proving impervious to the attacks of the Phylloxera. A report upon this subject from Her Majesty's Consul at Bordeaux last year stated that "the regeneration of vineyards in which the European Vine had been extirpated by the Phylloxera has been effected, as was pointed out would probably be the case, by means of European Vines grafted on American stocks. Direct production from American stocks has, fortunately for the wine-consumer, been abandoned as hopeless." If the most terrible scourge that has ever attacked the Vine industry is overcome by means of grafting it ought to convince those people who declared against grafting of the absurdity of their sweeping assertion that "grafting is a delusion, a snare and a makeshift."

Papers on the subjects of "Soils and Manures for the Vine," and on "Packing Grapes," were read, the former by Mr. W. Thomson, of Cloverfords, whose work on the "Cultivation of the Vine" has done so much to make Grape-growing in England what it now is. These papers will be published in the Journal of the Society, and to any one interested in the subjects upon which they treat they may be cordially recommended as the latest utterances of the masters of the art of Grape production in England.

London.

W. Watson.

Cultural Department.

An Alpine Border.

IT is often difficult to find the right place in the garden for small hardy plants, odd bulbs, or pieces of things which require some special attention, or which it is desired to keep under observation. Such things planted in an ordinary border are apt to drag out a miserable existence even if they survive at all. They are usually overshadowed and starved out by their vigorous neighbors, or, if they happily secure a share of sunlight, insufficient drainage on the level is the cause of serious losses, for many of the smaller plants are especially impatient of water at the crowns. In ample grounds there is usually little difficulty in arranging a suitable rockery, where such plants may be made perfectly at home and most of the conditions for their successful culture provided. In narrower quarters, however, rockeries are seldom, if ever, satisfactory, for, while beauty must often give way to utility, it is well to avoid unsightly fixtures, and it is scarcely possible to arrange a rockery whose utility will be so great as to overbalance its incongruity in an ordinary small, flat garden. It occurred to me last spring while studying the problem of growing various alpine plants that a special border devoted to small things might be arranged which would prove satisfactory to a fair extent, and, at least, always interesting to the cultivator. Perhaps "An Attempt at an Alpine Border" would more correctly head these notes, for my planting as yet has been tentative. A long, narrow grass strip, which divided a hardy border from the main path, was turned under, and the ground was suitably prepared. On each side of this narrow border a row of stones was placed, raising it a few inches above the path and hardy border. Where any special soil is required it is supplied, and, when necessary, special elevations made or extra stones added to the soil. Plants of Arabis, Androsaces, Drabas, Aubrietias, Poppies (nudicaule), Myosotis, Anemones, etc., seem at present well established, while various labels mark where, in the spring, may be expected some of the charming visitors of the early year. It is not expected that in such a border one can grow all small alpine plants (neither can most of us manage many of them in a rockery), but this simple suggestion is, perhaps, of use to some small grower with a fancy for the dainties of the floral world, or who wishes a place that will give a hospitable welcome to odd small plants and bulbs. Such a border is inclined to dryness, no water remains long on the crowns, and, if it is not handsome, it is not obtrusive.

The loss of a turf border has caused no regret, it being always a source of care and expense and rather commonplace. Perhaps as the various creeping plants project over the edge of the walk they will agreeably break the straight line of an ugly path.

Elizabeth, N. J.

J. N. G.

Rose Notes.

THE proper method of staking Roses which are planted out for winter blooming makes an interesting subject of study at this time of the year, when the plants are, or at least should be, in such a condition as to require some support. And careless or clumsy staking detracts greatly from the appearance of a Rose-house, besides being quite unnecessary; for neat stakes are readily procurable and at very moderate outlay. The shallow benches, so much favored for Rose-growing, do not contain a sufficient depth of soil to support the long stakes that are needed, and therefore many growers have adopted the plan of running a stout wire in line with the row of plants from one end of the bench to the other, the wire being three to three and a half feet above the soil, and the tops of the stakes are fastened to this wire. By means of this device quite slender stakes may be used—for instance, a square stake of cedar or poplar or chestnut half an inch in diameter will answer the purpose very well when supported at the top as described.

This makes quite a neat arrangement; but a less conspicuous one for the same purpose is composed entirely of wires, by using parallel upper and lower wires and replacing the stakes with upright wires fastened to each of the horizontal ones. The latter method offers the least possible obstruction to the light and also to the force of water when syringing, and provides a strong and durable trellis.

Another method of supporting Roses was recently suggested by a practical grower—namely, to stretch strips of wire netting above the bench and supported by a vertical wire at each side of the bench. The shoots of the Roses are to be tied to the netting, and it is expected that the plants will thus be spread out more, and, in consequence, receive more light and air than when tied in the usual manner. The netting alluded to was that made from galvanized wire, and of large mesh.

The often repeated injunction that Roses require plenty of fresh air should be well observed at this time of the year, so that all the growth the plants make is firm and solid, and, therefore, fit to withstand the strain of continued winter flowering. At the same time strong draughts should at all times be avoided, as mildew is sure to follow. A little artificial heat is generally found necessary at night in this latitude by the 1st of October, but this must be regulated by the weather, and some seasons it may be needed before this time; but the firing should be regulated carefully, for too much heat will do quite as much harm as too little. At this season of the year the advantages of steam heating for certain purposes become apparent, as the temperature may be more easily regulated under this system than with hot water, and this is nowhere more noticeable than in the Rose-houses.

Black mildew, or "black spot," as it is generally known, is now appearing on those varieties for which it shows a special preference, and may be increased rapidly by one over-watering, and this makes it essential that the watering should be done with caution at all times. A reliable remedy for this much-dreaded Fungus would be a great boon to Rose-growers, but thus far a real specific has not been discovered, though many have been tried. The most effective treatment seems to be the picking off of the affected leaves and the removal of all decayed leaves from the surface of the soil. This does not cure infected plants, but it helps to check the spread of the Fungus to a certain extent.

In the matter of varieties there seems to be but little change among commercial growers this season, most of the sorts favored last year remaining standard for this winter's trade. Among the newer varieties, Duchess of Albany and Madame Hoste are far in the lead in popularity, and both of these excellent sorts have been largely planted. Pierre Guillot finds favor with some large growers, though this Rose does not seem to grow freely in all soils. The flowers keep well after being cut, however, and when well grown have a fine color.

The general verdict seems to be that W. F. Bennett, though a beautiful flower when in good condition, does not pay the grower because it shows too many short-stemmed flowers, which do not sell well, and though there are many small lots of this variety to be seen, yet a hundred-foot bench of it is now a comparative rarity. Souvenir of Wootton does not seem to have superseded American Beauty, as was hoped at the time of its introduction, but still it is reported in some

instances to have proved a profitable variety last winter, and it will probably continue to be prized—at least for the local trade.

Holmesburg, Pa.

W. H. Taplin.

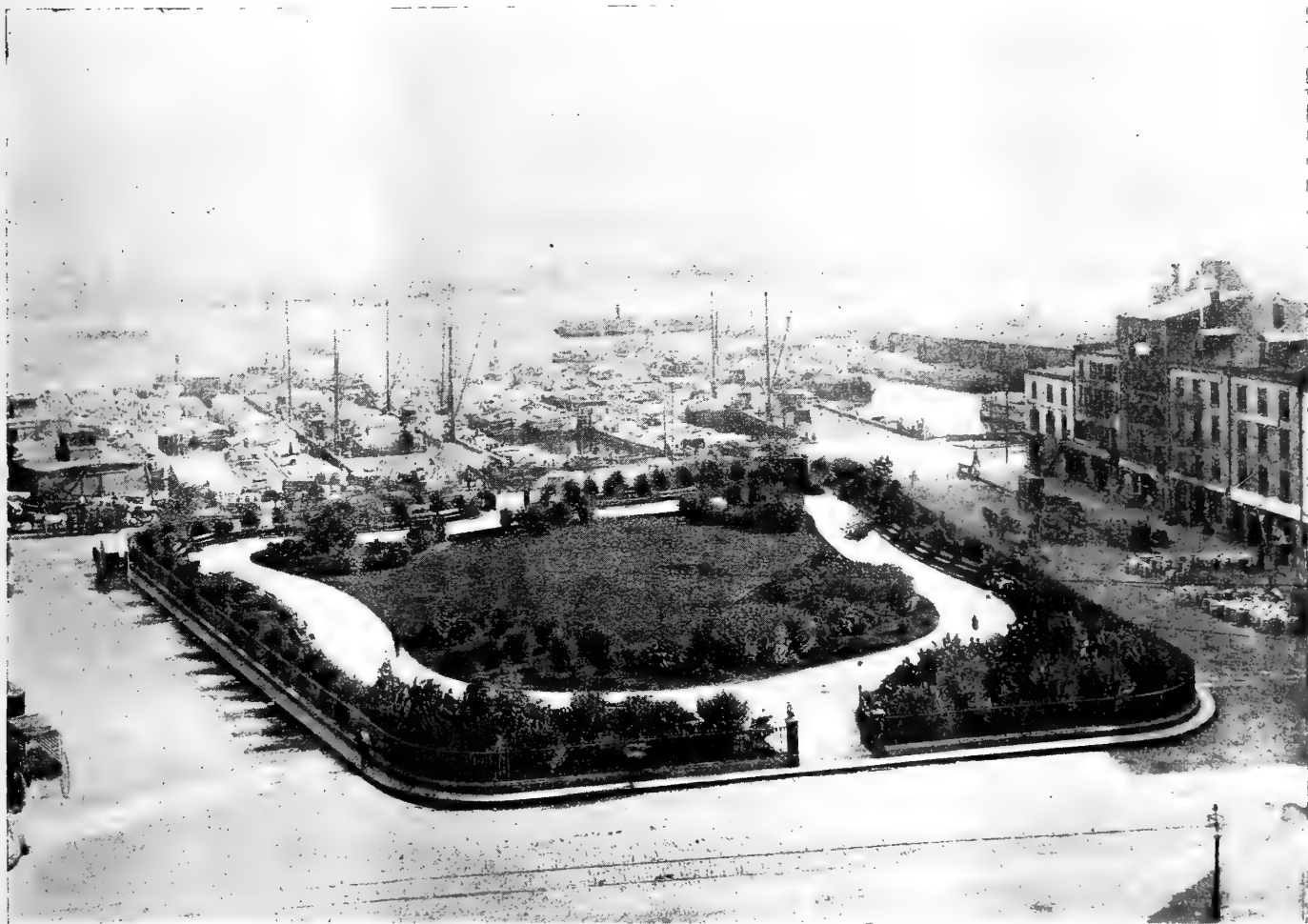
Notes on Shrubs.

Stephanandra flexuosa, first introduced by Veitch & Sons from Japan, has matured a little fruit at the Arboretum this season, the seed ripening in the latter part of September. Comparatively few of the numerous small blossoms which the plant bears develop into fruit, and a large proportion of this is without good seed. However, seed may be produced more freely as the plants become older. The fruit resembles that of the closely related Nine-Bark (*Physocarpus opulifolius*), except that it is a very great deal smaller. Usually only one, or rarely two, seeds are borne in a pod.

The little white flowers which this plant produces in June are not individually showy, but in the middle of the month, when

September, and it remains on the plants and keeps its brightness for a month or more. The pods are unusually large, and are produced in flattish clusters of from six to ten or more, suspended on slender stalks two or three inches in length. They are of a deep pinkish red color, and with the bright scarlet arils, which they disclose upon opening, they make a very handsome appearance; and as the long peduncles allow the clusters to hang much below the branches and foliage they make an effective and little obscured display of color.

E. latifolia is rarely seen in cultivation here, and when found in gardens usually presents a poor appearance by being stunted and crowded by other trees and shrubs. Under favorable circumstances it may attain a height of from ten to twenty feet. The leaves are large and broad, smooth and almost shining. The branches are smooth, the young shoots being reddish green in winter; and in the long, tapering, pointed, green buds we have a character which assists us in determining this species from all others when they are destitute of



Jeannette Park, New York.—See page 498.

they are most abundant, they present a delicate, graceful appearance, mingled with the fine foliage. It is for the sake of the foliage quite as much as for the flowers that this *Stephanandra* is of interest and value for ornamental purposes. The deeply cut and serrated, triangular, pointed leaves are about an inch in length; they are of a dark green color, and are sufficiently abundant to effectually cover the branches and stems. This is a fast-growing shrub, and while it has a somewhat close and bushy habit, it maintains a light and graceful appearance not possessed by many hardy, woody plants.

Although it has not been sufficiently well tested to warrant the statement that it is hardy, it at least promises to be an interesting and valuable addition to the list of plants which will do well in sheltered situations in this latitude.

While the fruits of nearly all the species of Spindle-trees (*Euonymus*) are more or less showy when they reach maturity, there are few which, for beautiful and showy qualities, produce fruit equaling that of the Broad-Leaved Spindle-tree (*Euonymus latifolia*) in its best condition. The fruit is perfected comparatively early in the season, being fully ripe early in

flowers, fruit or foliage. In common with nearly all plants, the various species of *Euonymus* show great differences in the times of maturing of fruits, and even in different plants of the same species there is sometimes as great a variation as a month in the opening of the pods. The common European Spindle-tree (*E. Europæa*) sometimes shows this in a very marked degree; and so does the Japanese Winged *Euonymus* (*E. alata*), so called because of the thin, corky excrescences on the branches, which give them a four-angled appearance. These thin excrescences or plates are produced at right angles to each other in the lines of the buds and branchlets which break their continuity at regular intervals. In some plants the corky excrescences are not very prominent, in others they are often a sixth of an inch long. The fruit of this species is small and mostly contains only one developed ovule, and as the stalks are short the pods appear almost sessile on the branches. On different plants the period of ripening or opening of the pods extends from about the 10th of September until near the end of the month or later. Although the arils of this species are of as bright a scarlet color as any in

the genus, they are not nearly so showy because they are small and much hidden by the leaves. The foliage of *E. alata* assumes rich purple, rosy red or scarlet colors in the autumn, constituting its chief merit and value in ornamental planting. A less valuable plant is the Warty-barked Euonymus (*E. verrucosa*) of central Europe. It is a species of close, upright habit, and with light green leaves. But neither foliage, flowers nor fruit are particularly striking; the chief interest and peculiarity being in the little wart-like excrescences by which the bark is thickly covered.

Arnold Arboretum.

J. G. J.

Growing Hippeastrums.

ONE of the most interesting papers in the latest volume of the Journal of the Royal Horticultural Society is on the Hippeastrum, or, as it is more generally known in gardens, the Amaryllis, by Mr. Harry Veitch. The story of the development of these flowers by selection and crossing up to their present beauty of form and varied brilliancy of color is admirably told, but we have space only for the following paragraphs relating to the cultivation of these plants.

SOIL.—The compost should consist of two-thirds good fibrous loam, such as is used for vines, and one-third cow manure fresh from the stall. These ingredients should be brought together toward the end of July, and allowed to remain in heap for about three months, when they should be turned over and well mixed together. The mixture must at no time be allowed to get too wet, and when required for potting, in the early part of the following year, a proportion to the whole of nearly one-third of silver sand should be added.

POTTING.—The pots selected should be in proportion to the size of the bulbs, and the smaller the pots that can be so used the better; in every case the drainage must be ample. Before potting, every vestige of old soil should be shaken off, and any decaying roots, and any other decayed matter that may be found about the bulbs, should be removed. The potting should be performed according to the time the bulbs are required to be in bloom, a period of eight to ten weeks being the usual interval between the potting and the flowering of the bulbs. We usually commence potting about the middle of January, and have bulbs in flower about the middle of March, the flowering season continuing for eight to ten weeks. After potting, the pots should be plunged in some suitable material; no bottom heat should be applied at first, but the bulbs should be allowed to start into growth as gently as possible.

TEMPERATURE.—After potting, the temperature of the house should be maintained at fifty-five degrees for three or four weeks, then a little bottom heat should be given, and the temperature of the house raised to sixty degrees F. With this temperature the house should be damped down occasionally, and when the weather is warm and bright a little air should be admitted at the top for a couple of hours in the middle of the day. When in flower, a light shading should be used to prolong the flowering season.

WATERING.—This requires the most careful attention; it is, in fact, the pivot on which successful Hippeastrum culture turns. More bulbs are injured or die from excess of water than from any other cause, and excess of water is one of the causes of the so-called Eucharis mite, one of the most destructive pests the cultivator of the Hippeastrum has to contend with. At the time of potting, the new soil should be a little moist; after potting, no water should be given for four or five weeks, or till the foliage and flower-scapes have attained a height of two or three inches; then it should be sparingly applied until the flower-buds appear, but from that time a more liberal supply should be given till the foliage is perfected; it should be then gradually reduced until about the middle of August, when it should be withheld altogether. Eight or nine weeks later the pots may be lifted out of the plunging material, and after an interval of another month all the plunging material should be removed from the house and the bulbs kept perfectly dormant on the stage till the potting season comes round again; the house, too, should be kept as dry as possible the whole time the bulbs are at rest. We use no liquid or artificial manure at any time. Much has been written in the horticultural press about the mite that appears both on the Eucharis and on the Hippeastrum, but we have no fear of it. In my opinion its prevention is simply a matter of not over-potting and not over-watering, and we have seldom seen bulbs, however badly affected, that could not be brought into perfect health again.

TREATMENT AFTER FLOWERING.—After flowering the pots should be kept plunged, and each pot and about half the exposed part of the bulb should be covered with the plunging material. When the roots begin to push, more bottom heat and more water should be given; the atmosphere of the house should be kept more humid, and the foliage occasionally syringed. In bright, warm weather a slight shading should be used, and the growth of the plants encouraged to proceed as rapidly as possible; for the stronger the bulbs the finer will be the flower-scapes and their flowers in the following spring. Toward the end of July the bulbs should be gradually ripened by diminishing the shading, and three or four weeks later the shading may be discontinued altogether and as much light and air admitted into the house as possible.

INSECTS.—There will be no difficulty with these pests if their first appearance is watched for, and their increase checked as soon as they are discovered. Thrips will spot the foliage, but fumigating occasionally will keep them under. During the summer months red spider will also attack the foliage, but their increase can be prevented by syringing and by keeping a moist atmosphere in the house. Sometimes mealy-bug appears, especially if the bulbs are placed near plants subject to the attacks of that plague; but it can be easily kept in check by cleaning or syringing with blight composition once or twice a week, and in winter, when the foliage has fallen, it can be seen and removed without much trouble.

Some cultivators of the Hippeastrum, as Mr. R. S. Holford, of Westonbirt, who possesses the finest amateur collection in this country, do not report their bulbs annually, nor do they plunge them as we recommend, but give them liquid manure during the growing season. The bulbs are also grown in different houses amongst other plants, and in vineries, and most successfully, too, with the advantage of prolonging the season to such an extent that a Hippeastrum in flower can usually be seen at any time of the year. The value of the Hippeastrum as a decorative plant can thence be scarcely underrated, for even when the scape is cut and placed in water the flowers continue fresh nearly as long as if left on the bulb. Some of the Dutch growers treat the Hippeastrum much in the manner we do, notably Mr. De Graaf, of Leyden, whose collection is a magnificent one, and to whom we are indebted for very valuable information when we commenced the cultivation of this beautiful plant, and with whom we are now in friendly rivalry in the raising of improved forms.

Achillea serrata, fl. pl.—My former note in GARDEN AND FOREST (p. 408) on the merits of this plant has called forth many inquiries, and I notice in the last number Mr. E. S. Miller's method of increasing it. A strong clump of this Achillea will produce quite fifty stolons, and if the plant is placed in a cellar until January each of these stolons will, if used entire when potted up, make vigorous plants with as many as six leading growths, and I consider this the best plan to adopt where a limited number of good plants are required. For trade purposes, where it is desirable to get the largest number from a given quantity of roots, it certainly is possible to take cuttings from every joint of the stolon, but, except for trade requirements, the plants will not bear comparison with those obtained from the use of the entire stolon potted in January or February. Achilleas may also be easily propagated from the young shoots produced on the flower-stems after the flowers are past, and if wintered in pots make good plants the next year.

Anemone Japonica.—The pot-culture of this Anemone, as advocated by T. D. H., is certainly a good way to treat this most delicately beautiful of autumn flowers. It was my privilege to see the plants spoken of, and better examples of good cultivation could not be desired. When I saw them they were already in flower, while ours in the same district, but planted out, were fully two weeks later. This season's frost did not visit us until the last week in September, and the Anemones have had ample time to flower and make a nice display, but when they can be had two weeks in advance by pot-culture this alone in some seasons would warrant the adoption of this method. Pot-plants of Anemone grown in this way are most serviceable for house-decoration, and help to fill the gap which always occurs between the loss of outdoor flowers and the advent of the Chrysanthemum season. If all roots of Anemones that are as thick as a Wheat straw are lifted in fall and placed in the cutting-bench they will at once begin to grow and may be potted in three-inch pots, and if these are grown on into ten-inch pots, and plunged out-of-doors in May, fine flowering specimens will be produced in September. In more favored sections the same pot-raised plants may be planted out-of-doors, there to remain, but in

the northern states this Japan Anemone is not reliably hardy, and it is always best to lift the roots and store them in a cool cellar until spring.

South Lancaster, Mass.

E. O. Orpet.

Vallota purpurea.—The Scarborough Lily (a name under which this plant was more generally known in England some years ago than it is at present) is one of those plants a well-grown specimen of which at once commands attention. The genus, named after the French botanist, Pierre Valot, has this representative alone, and it belongs to the *Amaryllidaceæ*. The Vallota was introduced from the Cape of Good Hope in 1774. The bulb is large and firm; leaves strap-shaped and evergreen; scape slightly longer than the leaves, bearing from five to ten, and sometimes even more, bright scarlet, funnel-shaped flowers in the form of an umbel. The plant succeeds best in the greenhouse, and it is an excellent subject for cultivation in the dwelling-house. It is rather a common plant in gardens, but from the weakly specimens generally seen it is evident that its cultivation is far from being perfectly understood. The soil best suited to its requirements is a mixture of good loam, fibrous peat, thoroughly decomposed farm-yard manure and sand in equal parts. When potting is necessary, it is best done soon after the flowering season. Care should be taken that the bulbs are disturbed as little as possible, and their crowns should be on a level with the surface of the soil. Frequent or annual potting is injurious, and should only be undertaken when a shift or renewal of soil is absolutely necessary. In the meantime give plenty of water and stimulating liquids during the season of growth. It is a mistake to dry off the plant periodically, for it needs no season of perfect rest like most other bulbous plants. In its natural state it is found in marshy districts, and it practically knows no dry season. Of course less water will supply its needs in winter, but at no time should the soil be allowed to get dust dry. The pots may be set out-doors during the summer months with advantage. In such cases a bright, sunny position should be chosen, with an ample supply of water, and the roots protected from the burning sun by shading the pots. The flowering season lasts through August and September, but if the plants are strong and healthy this season may be hastened or delayed by several weeks. The stock may be readily increased from the offsets which are freely produced by vigorous plants. There are several varieties of *Vallota purpurea*. Some of these have larger flowers than the type, in others the flowers are a trifle brighter.

Botanic Gardens, Cambridge, Mass.

M. Barker.

Spraying against Pear Blight.—The orchard of Mr. J. M. White, of Middlesex, New Jersey, contains some 1,200 trees, and early in the season the spraying was begun with a Nixon cart-pump, throwing two strong streams. With this cart and three men, with a boy to lead the horse, the entire orchard was sprayed thoroughly in four hours. The first spraying was with a mixture of London Purple for insects, and carbonate of copper with ammonia for the Blight Fungus. One Clairgeau tree was left unsprayed, and from this the leaves fell very early and the few pears produced soon followed. They were small, blotched and cracked so much as to be about worthless. The surrounding trees of the same variety retained their foliage well, and, as this was an off-year, prices were high and profits great. Mr. White saved several hundred dollars on his Clairgeau pears alone. The Duchess and other varieties were also benefited, as may be inferred from the fact that their owner secured an unbroken list of first premiums at the State Fair. This case is simply cited to show that the time has come when spraying machines of some kind must be adopted as regular implements on the farm. It should be understood that they can be used for the potato-field as well as the orchard and vineyard.

New Brunswick, N. J.

B. D. H.

The Forest.

The Forestry Exhibit at the Columbian Exposition.

WE find in the *Southern Lumberman* a paper read by Mr. Henry L. Tolman at the meeting of the Lumber and Forestry Committee of the National Commission in charge of the coming World's Fair at Chicago. The extracts given below will furnish a good idea of the character and scope of such an exhibit as the enlightened lumbermen of the country think the forest-interests of the country deserve:

The lumber business ranks third in commercial importance among our domestic industries, and for several reasons is en-

titled to a prominent department in the Columbian Exposition. The products of our forests are so varied, the forms into which they are manufactured so numerous, and the multitude of wood-working machines so great, as of themselves, when properly classified and arranged, to make a large and attractive display, not only to those directly interested, but to the world at large.

Again there is a scientific department to which attention has never been called, but which, if properly developed, would be of rare and novel interest. A study of the cell structure of trees in health and disease furnishes the only means for answering many of the practical questions—as to why wood decays, the relative value of sap and heart wood, butt or top logs, the comparative worth of Wisconsin, Kentucky or Louisiana white oak, white or yellow pine, white and red cypress, the comparative value of cedar, poplar, cypress, redwood, fir and other woods. Physical tests for transverse strain and compression made by elaborate and costly machines are constantly necessary to determine similar questions as to breaking weight, and their results can be instructively and effectively shown. A vast belt of Short-leaf Yellow Pine extending from Maryland south, skirting the Blue Ridge Mountains their entire length, and fringing the northern edge of the great Long-leaf Pine belt as far as central Texas, is rapidly coming into market, but the prejudice against it has been so great that until the last two or three years it has been compelled to masquerade under another name to find purchasers. Its inferiority has been greatly exaggerated, and science only can best determine its value as compared with that of its better known rival, the so-called Georgia Pine. The Government has recently begun measures to recover damages from turpentine distillers who have been boxing trees on unsold lands without license, on the ground that such boxing injures their growth and deteriorates them in value, and science will be called on to answer this question.

Extensive forests of Sweet Gum fill the swamps of Georgia, Alabama, Mississippi and Louisiana, which are comparatively valueless, because no successful way has been found of drying the lumber without serious surface checking, and science must solve the difficulty. Scientific facts are disseminated very slowly among the people by the ordinary channels, and the occasion we propose to celebrate offers an opportunity unequaled in the history of our country.

Having thus very briefly outlined a few of the many ways in which the solution of these scientific questions can be of real practical advantage, permit me to suggest how such an exhibit should be made.

First, there should be specimens of all the four hundred and twenty-five species of trees with which nature has beautified this, the forest continent of the world. These specimens should be cut at least three feet long, flat and rift sawed, so as to show grain and pattern, and giving bark, sap and heart wood. All boards should be dressed, and some of them polished in different ways to show the best manner of treating them. Transverse sections of the butt and top cuts should also be obtained, at least of the commercially valuable woods, to show the annual growth of rings, thickness of sap and bark, etc. If possible, specimens of leaves, flowers and fruit should likewise be obtained, not only for the aid of professed botanists, but to enable lumbermen to identify species, as it is a well known fact that common names of trees vary greatly according to the locality. In the Oaks, especially, the confusion of names is very annoying, and the quality of the different species varies greatly. Another interesting feature would be photographs enlarged under the microscope of specimens of woods, which would show far better than any ordinary examination the causes of the difference between different species. Numerous and exhaustive physical tests, such as were made of the various woods under the direction of the Census Bureau in 1880, should be shown, the results of which afforded valuable evidence as to the relative resistance of the various woods to strains and compressions, and their adaptability for bridge building, railroad ties or sills, and the like, or, on the other hand, for furniture or interior decoration. No wood unites in itself all the desirable qualities, and as gradually one after another of the most valuable kinds of wood become exhausted, at least in merchantable quantities, greater attention must be paid to the selection of satisfactory substitutes.

Besides specimens of native forest-grown trees, there should also be others of trees artificially planted in various sections. Some of them are large enough to give valuable data as to the comparative growth and quality of naturally-grown and planted-out trees. The same work might profitably be pushed still further, and important data thus be obtained toward

settling the vexed question as to whether our native forests can be replaced by artificial planting. The booths or rooms in which such exhibit is made should be constructed of native wood entirely, arranged so as to make practical application of the scientific facts above mentioned, and this feature would offer an indefinite field for expansion, where rival states as well as lumbermen could display their products.

Closely connected with this scientific portion, so as to show it to be a part of one symmetrical whole, should come the wood-working machinery of every kind, beginning with some specimen of the primitive sash or pit saw, through the wide range of circular and band saws, then gang saws, edgers and trimmers, shingle and lathe machines. Practical examples of the operation of this machinery should by all means be given, either on certain days or at certain hours. After these machines designed for reducing the raw material to manufactured form would naturally follow the more intricate planing machines, tenon and mortise machines, surfacers, moulding, barrel, matching, veneer, pail, nailing, sand-papering and turning machines, and the wonderful and novel carving machines, where the numerous manufacturers would properly have all the needed space to show the advantages of their rival inventions.

Lastly, it would be eminently proper, though perhaps not practical to the full extent, to have connected with the lumber and forestry exhibit a display of all kinds of articles made of wood, carved specimens, wood pulp, and the numerous articles made from it, such as pails, dishes, pressed ornaments, etc.

Too much stress cannot be laid on the necessity of system in such a varied and extended exhibit. Though logically the parts are all intimately connected, yet a careless, immethodical display, difficult to comprehend, would leave the ordinary visitor with no definite notion of any part, while one strictly subordinated to an orderly progression would give a clear, though perhaps from the nature of the case often a superficial view, but one which could easily be remembered and of permanent benefit.

Of equal importance is the question of some government supervision of at least the scientific part of the exhibit, if it can be done within the limits of the act. Lumbermen and machinery makers, practically interested, can be trusted to make a fitting display in the direction in which they are acquainted. They represent a broad minded class of men, already greatly interested in the widest success of a lumber exhibit, who can be relied on to join heartily in the exhibit, if only a proper initial movement is made. Hence the necessity of a generalship declared by a higher authority, not only impartial, but more catholic.

The best interests of the lumber industry, as well as of the Exposition, will be subserved by an exhibit covering as near as possible all branches of this department and allowing no one to usurp undue importance.

Correspondence.

Improper Pruning.

To the Editor of GARDEN AND FOREST:

Sir.—Will you give us your views on the removal of the lower branches from ornamental trees? Many people here insist that all lower branches must be trimmed away in order that the ground may be thoroughly cultivated up to the very trunks of the trees. Clumps of conifers, Grevilleas, Acacias and other trees are spoiled in this way and have about as much beauty as an ostrich. I leave you to imagine what an *Araucaria excelsa* looks like treated in this way.

Santa Barbara, Cal.

F. D. O.

[It should be the aim of cultivators of ornamental trees to preserve as far as possible all their lower branches. The highest type of beauty in a lawn or park tree is that in which the lower branches repose on the ground, and which present a solid mass of foliage from top to bottom. It is not easy always to produce trees of this description, and it can only be accomplished by allowing them abundant room and air on all sides for free growth and development. Even with sufficient space about them, certain trees, like some of the Pines and the Sugar Maple, lose their lower branches early and develop tall naked trunks. Lower branches are essential to the beauty of all coniferous trees which grow naturally with a pyramidal habit, like the Firs, Spruces and Araucarias. Nothing is more ugly than one of these trees deprived of its lower branches growing by itself as a specimen.

Lower branches perform a valuable service to the tree, especially such trees as grow in very moist climates or in situations where they are exposed to high wind. Young trees, like Firs and Spruces, which grow generally on high mountains where the rainfall and wind are excessive, are provided invariably with long lower branches, which have two purposes: first, to check evaporation from the ground immediately about the stems of the trees, and then by keeping the principal weight of the branches near the base of the tree to enable it to withstand severe lateral pressure from wind. Such trees as they grow naturally in the forest become crowded, and the lower branches being deprived of light, cease growing and gradually die and fall off, being no longer needed for the welfare of the tree, which is protected by its neighbors from evaporation from the surface of the soil and from the sweep of the wind.

A specimen tree growing by itself with all its lower branches preserved is in very much the same condition, so far as protection is concerned, as the same tree growing in the midst of a dense forest and entirely destitute of branches for a height perhaps of fifty or sixty feet. That this is true appears from the fact that if all its neighbors are cut away from about a tree which has grown in a dense forest, it will soon perish from exposure to the sun, or will succumb to the first severe gale. It is more important to check evaporation from the surface immediately about the trunk of a tree than it is to cultivate the ground. Trees feed only through the ends of their roots, which extend laterally as far or further from the trunk than the branches. The place to cultivate a tree is outside the spread of the branches, and not beneath them. The removal, therefore, of the lower branches of ornamental trees, especially of conifers, is a barbarous practice, which destroys their beauty and sometimes seriously threatens their existence.—Ed.]

Forest Destruction.

To the Editor of GARDEN AND FOREST:

Sir.—The impassioned oration of Mr. O'Neil, which is reported in the letter from Tupper Lake Station in the New York *Tribune* of October 6th, contains some extremely careless talk. How can a man expect what he says to be taken seriously when he declares that "there is no danger that the Adirondack forest will ever be destroyed"? Anybody who has any considerable knowledge of the region knows that great areas of it have already been entirely and finally destroyed. Every traveler from this Deadwater region down through the "Schroon country" to North Creek sees all day a scene of utter desolation unrolled before and around him. Not only has the forest been destroyed. That in itself would be but a slight matter, though every tree and bush and twig had been removed. But on these hills, across leagues and leagues of country, the soil itself has been destroyed and removed, and the rocks lie bare and glistening to the sun. This soil was the accumulation of countless ages of vegetable growth, and its destruction brings back the conditions under which nature began the work of placing it here. Everybody but Mr. O'Neil is aware that this region, now so utterly ruined, was formerly covered by most valuable forests. Now it will require uncounted centuries to clothe these bare rocks with the soil required to sustain a forest again. He says that traces of abandoned farms are to be found in all parts of the region. That is very true. But he says the owners have fled. Yes, they have fled to the adjoining tracts. Each one, after he has burned out and exhausted the soil of the acres he cultivated till it will never produce trees again, has moved a little farther up or down the valley, or over to the opposite side of the stream running through it, there to repeat the same process of devastation, not of the forest only, but of the soil itself. But the ruin of the aggregate area of their "farms" is a trivial matter compared with the destruction which has been produced by the extensive forest-fires which these farmers have recklessly started in burning off the brush and timber in order to plant a crop in the ashes. These people are still "fleeing" from place to place within the Adirondack region, and burning out new farms, which will in turn soon be abandoned.

It is no wonder that people who are familiar with the country along the Chateaugay Railroad should regard with apprehension the extension of the Northern road to Tupper Lake,

and the establishment of charcoal kilns along its line. The best basis for work for improvement is usually the recognition of existing conditions and facts.

Deadwater, N. Y.

R. D. W.

Spring or Fall Planting?

To the Editor of GARDEN AND FOREST:

Sir.—There are some things that it seems are never settled. The reason is, that their settlement depends on conditions which may vary in every individual case. One of these things that are destined to remain in dispute is the question of spring or fall planting. I have always contended, with the best authorities, I believe, that trees may be planted at any season of the year, provided it be done with proper care. The question then remains, what is "proper care"? and the kind and amount of care necessarily differs with the season and locality.

I wish to call attention to one care which may be necessary where fall-planting is practiced in northern latitudes, and which suggested itself to me when inspecting the plantations of M. Joly, near Quebec, after the meeting of the American Forestry Association at that city.

M. Joly de Lotbinière, whom all defenders of the forest know, or ought to know, as one of their staunchest and most influential friends in Canada, delights in making the Black Walnut grow far beyond the natural limits of its northern distribution. As recorded at length in the Proceedings of the Forestry Congress for 1885, after the severe winter of 1884-5, quite a large number of his trees were found dead in the spring. Examination developed the fact that the bark had been severed from the wood below the root-collar underneath the ground and for some distance along the roots near the surface of the soil; it was also observed that the trees which had succumbed stood in places where the wind had been able to sweep away the snow. The soil had evidently been severely frozen, and when thawing, in contracting away from the roots, had torn off the bark; where the frost did not penetrate the roots remained intact. M. Joly now has provided Willow hedges to collect and hold the snow, or he packs it where it seems necessary.

This suggests that where the soil has been newly dug the danger from frost is very great, since seedlings are sometimes entirely uprooted and heaved out by the frost; and that snow is a very efficient mulch where mulching is one of the cares which may be necessary for fall-planting in cold latitudes.

By the way, it seems to be time that a forestry association should avoid such planting as was performed at the end of the meeting at Quebec, where two Hickories sent from the sunny clime of Tennessee—from Andrew Jackson's own grove, it is true—were set out on the cold rock in front of the Parliament Buildings. Though the sentiment was praiseworthy, sound forestry would forbid the use of such plant material, which is bound to succumb, and the Forestry Association cannot afford to set so bad an example.

Washington, D. C.

B. E. Fernow.

Recent Publications.

The Flora of the Kurile Islands, by K. Miyabe. Memoirs of the Boston Society of Natural History, volume iv., No. 7. Boston, 1890.

This excellent piece of work is from the pen of a former student in Harvard University and now the professor of botany in the college at Sapparo. After some general remarks on the physical geography of the Kurile Islands and a carefully worked out analysis of the composition of the flora, Mr. Miyabe gives a catalogue of the 307 species of plants which have been detected on them at different times, including those noticed by himself during a journey made to some of the southern islands in 1884. The critical notes on the characters and distribution of many of the species are specially valuable and interesting, the whole forming the only account of the flora of this group of islands, which extends for a distance of nearly 800 miles, from the Island of Jesso to the southern point of Kamschatka, and forms the boundary between the Sea of Okhotsk and the northern Pacific. Only a few of these islands are inhabited, owing to their barrenness and lack of good drinking water, and all are precipitous and inaccessible from the south side. The few bays which they do possess on the north-west and north-east sides are barely protected from the wind and do not serve as safe harbors for vessels. It is not remarkable, therefore, that so little has been known of their natural history, especially as they are encased in ice from November until April, while navigation in their

neighborhood during the early summer months is made difficult and dangerous by drifting ice from the north.

Mr. Miyabe's analyses of the composition of the flora bring out the fact that 84 per cent. or 156 of the genera of plants found on these islands occur in Europe, northern Asia and North America; while of the remaining thirty-one genera only three, *Skimmia*, *Crawfordia* and *Acanthopanax*, are confined to eastern and tropical Asia, while there are only four genera in the Kurile Islands which are peculiar to eastern North America and to eastern Asia—these are *Leucothoe*, *Diervilla*, *Hydrangea* and *Astilbe*. When it comes to species, thirty per cent. are distributed through Europe, northern Asia and North America, while only two rather doubtfully endemic have been noticed on the islands, whose flora is also remarkable in view of their northern position in the small proportion of circumpolar species. Fifty-five species extend into Europe, while eighty grow in North America. Of these, thirty-four are limited to north-western America, including Alaska and British Columbia; twenty-two extend southward to the Rocky Mountains and through the high mountain ranges of the Pacific states, and twenty-four are widely distributed across the continent.

Mr. Miyabe's conclusions, based on a careful investigation of this insular flora and of its relations to the floras of America and north-eastern Asia and of Japan, lead him to agree with Professor Milne in the opinion "that at the time of the last great southerly migration of the rich polar flora, Japan received her portion mostly through the Island of Saghalin, and but little, if any, through the then incomplete chain of the Kurile Islands."

The report made by the Earl of Meath on the public parks of America to the Committee of the London Council on Parks and Open Spaces has now been printed, by order of that body, in pamphlet form. It contains Lord Meath's views upon the American park system, already expressed in an article published in the *New Review* for May, and noticed at the time in this journal. The descriptive list of parks and open spaces in America, which is appended to the report, contains more complete statistical information of the area, cost, etc., of the pleasure-grounds of the United States than will be found elsewhere.

It appears from this report that of the large cities of the world of which we have park statistics, Paris is the best provided with parks with 25.55 acres for every 1,000 inhabitants, and a total park acreage of 58,000 acres. Vienna comes next with 7.25 acres for every 1,000 inhabitants and 8,000 acres of park. The park capacity of Tokio surpasses that of other European cities and of all the large American cities with 6 acres for every 1,000 inhabitants and 6,000 acres of park. London, with 22,000 acres, has but 5.76 acres for every 1,000 inhabitants, while New York, with the new system of parks included, has but 4.29 acres for every 1,000 inhabitants. Philadelphia has but 3.38 for every 1,000 inhabitants, while Chicago, which is better provided with parks than any other large American city, has 5.66 acres for every 1,000 inhabitants.

Lord Meath finds several things to admire in the American parks, and names, especially, the introduction of tropical Water Lilies into fountain basins in the parks of Chicago and New York, the lofty Palm-houses in South Park, Chicago, and in Druid Hill Park, Baltimore; the public ball-room in Jackson Park, Chicago, a permanent structure of stone and brick sufficiently large to contain 2,500 people, with a floor of polished maple for dancing and a music gallery; the lawns in Central Park in this city and in Prospect Park in Brooklyn, specially devoted to such games as tennis, croquet, base-ball and archery; the setting aside of special places for picnics, a custom which prevails in all the large parks of this country; the boats and carriages owned and controlled by the commissioners of some of the parks and leased to visitors for a fixed price; the swings which are provided in Central Park for children, with goat-carriages, swan-boats and other devices for their amusement; the music, which is provided free in almost all the principal parks of America, and especially the open-air gymnasium, one of the features of the Charles River Embankment in Boston. The lighting of small parks and other open spaces in American cities Lord Meath finds worthy of imitation in London, and it is surprising that in a city so crowded the open spaces have not already been made available for the public during the night in this way.

Notes.

At Indianapolis, Dr. Britton, of Columbia College, read a paper, prepared by request, which gave an account of the present state of systematic botany in North America.

Cyclamens are largely grown in Berlin, and at a recent flower show in that city there were forty exhibitors of this plant.

Plants one year from seed are strong, and bear from fifty to a hundred buds.

Sir Joseph Hooker's interesting and sympathetic account of the scientific career of the late John Ball prepared for the Journal of the Royal Geographical Society has now been issued separately.

In an article on irrigation in China, General Tchong Ki Tong says in the *Revue Scientifique* that the system of water regulation in that empire is one of the greatest achievements of the intelligence and labor of man.

Very striking just now, when flowers are rare, are tall plants of Maximilian's Sunflower. In good soil these are eight or ten feet high, and where they have been properly tied up they spread out into a great dome of bright yellow blossoms which last a long time.

One hundred and sixty-five varieties of Rice, says a recent writer in the *Popular Science Monthly*, are recognized by the planters of Ceylon. The product of Chinese plantations was greatly improved by the influence of imperial edicts prohibiting the planting of any but the largest grains, while the best variety grown in our own country is due to the intelligence of a South Carolina planter who, noticing some very long grains on an ear, secured them and perpetuated their excellence.

Mr. E. W. Hammond, of Wimer, Oregon, sends the dimensions of an Elder-tree (*Sambuca glauca*) growing in Jacksonville, the county-seat of Jackson County, in that state, which are worth putting on record. This remarkable specimen, which is believed to have been planted in 1859 or 1860, now girths seven feet two inches at three feet from the ground. The trunk retains the same size up to five feet; then increases somewhat up to its division into main branches, which occurs at eight feet from the ground. The spread of the branches is thirty-three feet, and the total height of the tree about forty. The enlarged base of the trunk girths 141 inches.

Mr. Charles Mohr has published an interesting pamphlet on "The Medicinal Plants of Alabama," describing not only their distribution and their characteristics, but the proper time for collecting their useful portions. As the forests north of the Ohio have been cut away, the centre for the supply of medicinal plants has shifted to North Carolina and the northern parts of Alabama are now also being drawn upon. Most of these plants are forest-nurslings, and thus, says Dr. Mohr, "we find the interests of the healing art closely connected with the question of the preservation of the forests of our country, and the pharmacist should feel in duty bound to unite his efforts with those who are already striving to secure this important object."

A method of marketing fruit which originated in Schleswig, but which has extended to many other parts of Germany, has proved successful in securing buyers against a bad article and in giving an opportunity for good growers to make sales of a good article. Samples of various fruits are placed in dishes for exhibition in a sales-room by growers who are prepared to furnish various kinds. The buyer has only to write his name and address on a card, with the quantity he wishes, and leave it at the central office, with the number of the plate. The order is then forwarded from the office to the grower, who in turn delivers his goods there. Here the fruit is inspected, and if it comes up to the sample in quality it is forwarded to the buyer. If it proves inferior it is returned at once to the grower. A grower who, on three occasions, furnishes goods inferior to the samples is excluded from the market. The office receives 10 per cent. commission for inspecting, forwarding, etc.

The *Gardeners' Chronicle* says that a technical school has been established at Lambeth for the purpose of teaching weaving on the most scientific principles, and also for that of testing the leaves of all promising plants, "to see if any suitable substitutes for Flax and Hemp can be discovered. Previous would-be discoverers . . . have failed through want of funds, time, patience or some other necessary. At the factory we now speak of the leaves of Agaves, Aloes, *Phormium tenax*, Palms and Rhea have been tried with good, but not entirely satisfactory, results. The processes necessary for the conversion of a fibrous leaf into a textile fabric are complex and tedious: among many others may be cited those of removing the gum, combing, spinning, bleaching, dyeing and weaving, which not only have to be performed, but done as well and speedily as possible. To find any plant with fibre which will lend itself to all these processes and which will be sufficiently cheap and productive is the aim and the object of Mr. Taylor Burrows, the manager of the factory, who is prepared

to test any fibrous plants submitted to him for that purpose, and to give any information concerning the botany of such specimens and the best way of raising them in quantities, should such a proceeding prove worth while."

One of the bulletins of the Ohio Experiment Station, after speaking of the difficulty which attends the testing of soils in the laboratory, says that the results of investigations on the spot are equally uncertain. "Take any single acre of ground for illustration. An open glade in the original forest may have permitted the wind to sweep away its winter coverlet of leaves, and they may have lodged in a thicket of underbrush adjoining, carrying stores of potash and phosphoric acid with them. Such a glade may have been for centuries the pasturing ground of deer. It would then accumulate nitrogen, but would lose potash and phosphoric acid through an additional channel, while the thicket would accumulate these in excess of nitrogen. The growth of a surface-rooting tree in one spot, may have drawn upon the adjacent surface-soil for supplies of potash; that of a tree with a deep tap root in another may have drawn its support largely from deeper layers of the soil and also have opened a way for drainage. A slight depression of the soil here may have received added fertility in the waste from a slight elevation there, and he who has studied the soil carefully, especially where its levels are shown by the melting of snow when the ground is frozen, will have detected irregularities of level unsuspected by the casual observer."

An admirable system for labeling the trees and many of the important shrubs in the National Botanic Garden in Brussels has been adopted. Sheets of stiff metal twelve inches by eight are covered on the outer surface with white enamel, on which, at the top, are printed the Latin name of the plant, with the best known French and Flemish names below. Under the name a map of the continent to which the plant belongs is drawn in black lines, and the area of its distribution marked in red. This is practically the same system of labeling as that which has been in use for several years in the Jesup Collection of North American Woods in the Natural History Museum of this city, and which was awarded last year a medal of the Paris Exposition. The labels in the Paris Garden are attached to large trees by a small screw and are placed on a level with the eye. For plants which are not large enough to carry the label it is fixed at the top of a stout iron rod placed before them. The metal used for the label is stiff enough to prevent it from being easily bent or broken, although the authorities complain that the enamel is sometimes cracked and defaced by boys throwing stones at the labels. One of the garden staff is constantly employed in preparing these labels, which are produced at what seems the surprising low price of about one franc each.

An interesting picture, recently published in the *Revue Horticole*, shows how the Japanese, not content with dwarfing and distorting plants, sometimes cause them to simulate a totally alien manner of growth. It was drawn from a specimen exhibited at the International Exhibition last summer and represents *Aspidium lepidocaulon*, a Fern which the botanical dictionaries describe as stemless or nearly so, with fronds from one foot to a foot and a half in length, which often have a long filiform tip furnished with a terminal bud ready to take root. In the picture aforesaid there appears to grow from the soil in the pot a rough, swollen stipe as large as a cocoanut; from this spring, at diverging angles, two similar bodies, and from the top of each of these grows a luxuriant tuft of fronds. When the seemingly single plant was examined the process of its manufacture was made clear. Several plants with their roots had been taken, and the roots wrapped, up to the springing of the leaves, in compressed Moss, forming ovoid bodies, two of which seemed to grow from the one beneath them, the different plants being so placed, at various heights, as to simulate ramifications. These ovoid bodies had then been carefully wrapped in Palm fibres so delicately manipulated as to appear a natural envelope. Thus the Ferns were actually growing in the concealed Moss while seeming to be nourished from the earth in the pot through the large artificial (but natural-looking) stipes.

Catalogues Received.

P. J. BERCKMANS, Augusta, Ga.; Fruit and Ornamental Trees, Hardy Evergreens and Roses.—WM. C. CUSICK, Union, Ore.; Flowering Plants and Ferns.—DAMMANN & Co., San Giovanni a Teduccio, Italy; Vegetable, Flower and Tree Seeds, and Bulbs.—A. DESSERT, Chenonceaux, Indre-et-Loire, France; Tree and Herbaceous Pæonies.—PETER DURYEE & Co., 68 & 70 Vesey Street, New York; The Styron Fence.—P. H. FOSTER, Babylon, N. Y.; Fruit and Ornamental Trees.

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The Madroña.

THE forests of North America contain two broad-leaved evergreen trees unsurpassed by those of any other temperate region of the earth's surface. They are the Great Magnolia, the glory of our southern forests, the handsomest and perhaps the most esteemed of all garden decorations, and the Madroña of the humid coast-region of Oregon and California. This is the *Arbutus Menziesii*, and by far the largest and most beautiful of the trees of the small genus to which it belongs, and one of the most remarkable and interesting of all the trees of the northern Pacific forests.

The genus *Arbutus* is common to the Old World and the New. One species is widely distributed through southern Europe from Spain to the Caucasus, ascending the west coast of the continent to Ireland, where it abounds in the neighborhood of the Lakes of Killarney. This species, the *Arbutus Unedo* of botanists, the so-called Strawberry-tree, has been cultivated from time immemorial in gardens, which it decorates with its evergreen foliage and handsome white flowers. These appear late in the autumn simultaneously with the ripening of the brilliant red fruit of the previous year. A second species, *Arbutus Andrachne*, inhabits the Levant, and is sometimes seen, too, in the gardens of southern Europe. But the headquarters of the genus in the multiplication of the species is Mexico, where several little known and imperfectly defined forms exist. Two of these extend north of the boundary of the United States, one into Texas, where it occurs in the western part of the state in a few isolated stations, and the other into Arizona, where it grows high up on some of the mountain ranges in the extreme southern part of the territory. The home of the Madroña or of its ancestors was once, no doubt, among the Mexican mountains, where species which much resemble it still occur; but now it ranges far northward from the Santa Lucia Mountains, in southern California, to the islands which guard the coast of British Columbia. In favorable situations in forests influenced by the fogs and rains attracted to the coast from the surface of the Pacific, it attains a great size, shooting up to a height of more than 100 feet, and forming, when it grows

surrounded by other trees, a tall, stout trunk three or four feet in diameter. Such a specimen appears in our illustration on page 515. It is made from a photograph of a forest-scene in California, sent by Mr. C. H. Shinn.

Often the Madroña appears on the dry foot-hills east of the outer coast range, where the forest is open, and the trees stand at a considerable distance apart, assuming a round-topped, spreading habit of growth. Developed under such conditions the Madroña looks at a little distance like some great Apple-tree. A surprising specimen of this sort—the greatest Madroña-tree in existence, perhaps—is growing near the reservoir in the town of San Rafael, across the bay from San Francisco. Great horizontal branches shoot out from the short and immensely thick trunk, and support a broad, symmetrical mass of foliage. This tree, which is certainly one of the marvels of arborescent growth, might well be taken for one of the great Live Oaks of California, which hardly surpass it in breadth of branch or in density of foliage. Its portrait will appear later in this journal, and will serve to illustrate one form of the Madroña which, south of the Bay of San Francisco, grows less vigorously than at the north, becoming smaller and smaller, until toward the southern limits of its distribution it is reduced to a low, stunted shrub.

The bark of the Madroña, like that of the other species of *Arbutus* and of the nearly related *Manzanitas*, which abound in California, is its most striking feature. It is very thin and smooth on the branches and young trunks through its separation into thin plates, and bright red-brown. On old trunks only, especially near their base, it becomes thick, furrowed and dark colored. In the species which is found in Arizona the mature bark is nearly white, or not unlike in color the bark of the White Oak, which it further resembles in the small, thin scales into which the surface separates. The bright red color of the branches of the Madroña heightens the effect of the ample ovate leaves, which are four or five inches long by half that breadth. They are thick and beautifully lustrous on the upper surface and pale on the lower. The flowers, which are shaped like those of some of our Blueberries and *Andromedas*, for *Arbutus*, like these, belongs to the Heath family, are white or greenish white, and are produced in large, terminal clusters or racemes. They unfold in early spring, and are followed by masses of orange-red berries, which brighten the trees for weeks in the late autumn.

The Madroña was naturally one of the first trees of our Pacific forests to attract the attention of botanists. Archibald Menzies, who is commemorated in its scientific name, the Scotch physician and naturalist, who sailed with Vancouver from 1790 to 1795, and who discovered and carried to England another remarkable tree, the *Araucaria* of Chili, first detected it, probably, near the mouth of the Columbia River. Thirty years later David Douglas recognized its value and sent seeds to England from the same region.

Economically the Madroña is a tree of considerable value, yielding a hard, straight, close-grained wood of a handsome pale red color, of real value in cabinet-making, provided sufficient care is taken in properly seasoning it. It is already largely consumed in the manufacture of charcoal, and the bark furnishes excellent tanning material. It is as an ornamental tree, however, that the Madroña first claims attention. It is not an easy tree to manage always, as the absence of fibrous roots makes any but nursery-grown specimens difficult to transplant. It is not hardy in the eastern states, and in Europe it will probably develop its greatest beauty only in such exceptionally warm and moist regions as Devonshire, the south of Ireland, the islands of the British Channel and some parts of western France. Specimens are occasionally seen in these favored localities, but we have no record of any large or exceptionally fine ones.

The Californians, who possess within their own territory the most wonderful as well as some of the most beautiful trees known to man, unfortunately neglect the material they have ready to their hands and ransack

the world for exotic trees with which to beautify their homes; and California valleys are fast becoming converted into groves of Eucalyptus and Acacias, while one looks in vain outside the rapidly disappearing forests for the native trees, which are world-wide wonders, and which ought to be the pride of every true Californian. There may be seen, to be sure, at every turn groves and specimens of the Monterey Pine, one of the ugliest of all its race, and of the beautiful Cypress of Monterey. These two trees are almost the most local and restricted of all American trees in natural distribution, but, strangely enough, they are easily propagated and transplanted and grow in cultivation at first with surprising rapidity, so that they are now scattered from Victoria to San Diego. But one looks almost in vain in the gardens of California for the other trees which give character, value and beauty to the forests of the state—the Oaks, the Pines, the Firs, the great Broad-leaved Maple, the Evergreen Laurel, the Manzanitas, and all the host of smaller trees and shrubs with curious foliage and beautiful flowers. But sooner or later the Californians will appreciate the beauty of their own forests and realize the value of the trees of California for the decoration of the gardens and parks of California, and then the Madroña will certainly attain the position it deserves among ornamental trees.

As we recall all the beauty of this marvelous tree seen in some sheltered forest glade of the north-west coast, we recall the words which the venerable Albert Kellogg, who loved the trees of his adopted state so well and studied them so faithfully through long years, once spoke of the Madroña; and to his question, "whether imagination, fiction or fancy can portray to itself a sylvan object more wonderful, more chaste or more charming," we can find no answer but one of negation.

The Proposed State Forest-Park.

RECENT articles in the New York *Tribune* regarding Adirondack matters mention the increase in the price of timber-lands as one of the results already produced by the extension of the railroads in the Adirondack region. This increase is a natural consequence, and has long been foreseen by intelligent observers of the course of things in the northern part of the state. This inevitable advance in prices will render more difficult the acquisition of lands for the proposed State Park or Forest Reservation, but it is an advance which is likely to continue for some time to come. It is not probable that the lands needed for a reservation for the protection of the sources of the great water-ways of the state can ever be acquired more cheaply than now, unless the state waits for more of the land to be burned over and completely desolated and destroyed; but this process would also destroy the rivers which the park is intended to preserve.

In his message to the Senate last winter the Governor recommended that the limits within which lands are to be retained by the state for the purposes of a state park should be settled and defined, and that they should include the wilder portion of the region covering the mountains and lakes at and around the head-waters of the several rivers which have their sources there, including the Hudson River. This recommendation was referred by the joint action of the two houses of the Legislature to the State Forest Commission, with instructions to make a thorough investigation of the possibilities of such an undertaking, and to report to the Legislature its conclusions thereon, and its recommendations as to the most effective methods to be employed to accomplish the end in view—the establishment of a State Park—together with any pertinent facts within the knowledge of the Commission relating to the general subject of forest-preservation or extension, and also to report the number of acres or square miles of land essential to fulfilling the requirements of a suitable reservation or park and the probable cost thereof.

This is the only plan of action, or suggestion of a plan, looking to the establishment of a state forest-park which

has been presented to the public. The Commission has been making investigations during the summer, and in its forthcoming report it will, of course, present the main proposition in an affirmative form. That is, it will recommend the establishment of a state forest-park, so that all those who are in favor of that object can unite in support of the essential idea of the report, which is in every way desirable.

Other plans may be proposed after the Commission's report has been presented to the Legislature. Full discussion, not only in the Legislature but in the press of the state, will be necessary in order to develop the popular judgment regarding the enterprise. There appears to be an increase of public interest in the subject, and a more general impression than hitherto that something is likely to be done. It is to be hoped that this impression is well founded, and that some plan will be presented in support of which all who feel an intelligent interest in the destiny of the Adirondack forest-region can heartily unite. It is not likely that the expectation of the Governor, that "a state park from fifty to seventy miles square can be obtained by the State in that region at comparatively trifling expense," will be realized. The necessary cost of the land of such an area will not be trifling. But it will be less this year than in ten or twenty years from now, and for a possession so valuable as a forest-reservation of this extent around the sources of the principal rivers of the state the people of New York should be willing to pay a reasonable price.

THE annual report of the General Commissioner of the Land Office of the United States has appeared. Judge Groff, the Commissioner, devotes considerable attention to the forest-problem. The means at the disposal of the Secretary of the Interior for protecting the forest-property of the nation is acknowledged to be entirely inadequate; and it is found that the most valuable timber on the public land is being exterminated unlawfully wherever forests exist. This is not a new discovery. The same thing has been stated more than once in previous reports from the same office; and it has been a notorious fact for years with all persons familiar with the actual condition of our western forests that, unless energetic measures are adopted for their protection, the practical extermination of these forests is only a matter of time. This subject has been brought to the attention of Congress year after year; bills looking for forest-preservation have been introduced again and again, and have met with the hearty approval of intelligent men in all parts of the country. Congressional indifference and local opposition from the forest-region, fostered by men directly interested in forest-destruction, have prevented the passage of any proper legislation for the protection of the nation's forests. This is a matter of urgent and commanding importance to the well-being of the whole country, and it cannot be safely postponed. Delay is danger, and danger which is real and impending, although not always readily understood by persons who are not familiar with the topographical and climatic conditions of the western part of this continent, which must become uninhabitable as soon as the forests which protect the valleys from the heights above them are swept away.

The use of the army of the United States to protect the national forest-domain until some better plan has been devised has been suggested by this journal, and, as yet, no better scheme has been proposed. It promises efficiency and has the advantage of economy. The press of the country and many thinking men sanction it with their approval.

"Great attention must also be given to the situation in which a building is to stand. A feudal castle in the middle of a wheat field—as at Machern, near Leipzig—is almost comic; as is an Egyptian pyramid in a gay Birch grove or a pastoral landscape, or a thatched hut surrounded by a French parterre.

"In the same way pointed Gothic architecture appears out of place when set among pointed Firs or Lombardy Poplars, while it is in place among round-headed Evergreens or Oaks and Beeches."—From Pückler-Muskau's "*Andeutungen über Landschafts-gärtnerei*."

Cape Cod Cranberries.

CRANBERRY-GROWING is unique among our horticultural industries. All a man's knowledge of gardening and fruit-growing in general is useless when he undertakes to grow this berry. He must lay aside his common notions of soils and tillage, and even discard the very tools which from boyhood he has considered essential to any kind of cultivation.

The Cranberry-growing sections of the country are few and scattered. The Cape Cod district is the pioneer ground of Cranberry culture, and it still undoubtedly holds first rank in general reputation. In provincial parlance the Cape Cod region includes all the peninsular portion of the state, beginning with the lower and eastward projection of Plymouth County. The Cranberry region extends from this eastern portion of Plymouth County eastward to the elbow of the peninsula, or, perhaps, even farther.

Upon one of the upper arms of Buzzard's Bay is the old town of Wareham. Here the tides flow over long marshes bordering the inlet, and rise along the little river which flows lazily in from the Plymouth woods. Here the sea-coast vegetation meets the thickets of Alder and Bayberry and Sweet Fern, with its groups of Wild Roses and Viburnums. And in sheltered ponds the Sweet Water Lily grows with Rushes and Pond Weeds in the most delightful abandon. In the warm and sandy glades two Dwarf Oaks grow in profusion, bearing their multitude of acorns upon bushes scarcely as high as one's head. The Dwarf Chestnut-Oak is often laden with its pretty fruits when only two or three feet high, and it is one of the prettiest shrubs in our eastern flora.

Driving northward over the winding and sandy roads into the town of Carver, where the largest Cranberry plantations are located, our journey lies in the Plymouth woods. And here the surprises begin! We see no fields of Corn and Grass, and snug New England gardens, and quaint old houses whose genealogies run into centuries; but we plunge into a wilderness!—not a second growth, half-civilized forest, but a primitive waste of sand and Pitch Pine and Oaks! The country has never been cleared, and it is not yet settled! And in its wilder portions deers are still hunted and lesser game is frequent! And only fifty miles away is the bustling Hub of the universe!

This Cape Cod region is but a part of the sandy waste which stretches southward and westward through Nantucket, along the north shore of the sound and through a large part of Long Island; and essentially the same formation is continued along the New Jersey seaboard. Similarities of soil and topography are always well illustrated by the plants they produce. The Pine-barren flora of New Jersey reaches northward into the Cape country, only losing some of its more southern types because of the shorter and severer seasons. But more diligent herborizing will no doubt reveal closer relationship between New Jersey and Cape Cod than we now know. An instance in my own experience illustrates this. The Striped Sedge (*Carex striata*, var. *brevis*) is recorded as a rare plant, growing in Pine-barrens from New Jersey southward, and yet in these Plymouth woods, in the half sandy marshes, I found it growing in profusion. Even eastern Massachusetts is in need of botanical exploration! So the floras run along this coast; and it is not strange that Cape Cod and New Jersey are both great Cranberry producing regions.

The country comprises an alternation of low, sandy elevations, and small swamps in which the Cassandra, or Leather-leaf, and other Heath-like plants thrive. The Pitch Pine makes open and scattered forests, or in some parts Oaks and Birches and other trees cover the better reaches. Fire has overrun the country in many places, leaving wide and open stretches carpeted with Bearberry (*Arctostaphylos*) and dwarf Blueberries. Clear and handsome little lakes are found in some parts of the wilderness, and everywhere one finds clear and winding brooks, abounding in trout. And over all the open glades the great-flowered Aster (*Aster spectabilis*) is brilliant in the autumn sun.

It is in the occasional swamps in this sandy region that the Cranberry plantations or "bogs" are made. In their wild state these bogs look unpromising enough, being choked with bushes and brakes. I am filled with a constant wonder that the sandy plains are not also utilized for the cultivation of Blueberries. These fruits now grow in abundance over large areas, and they are gathered for market. It would only be necessary to enclose the areas, protect them from fire and remove the miscellaneous vegetation, to have a civilized Blueberry farm. Certainly Cranberry and Blueberry farms would make an interesting and profitable combination. The expense of growing the Blueberries would be exceedingly slight, and

the crop would be off before Cranberry picking begins. To be sure, wild berries are yet common, but they would not interfere with the sale of better and cleaner berries which would come from improved plantations. Wild Cranberries are still abundant over thousands of acres, and the production of cultivated berries is rapidly increasing; yet the price has advanced from fifty cents and one dollar per bushel, with an uncertain market, fifty years ago, to fifteen and twenty cents a quart.

The largest cultivated bog in existence lies about six miles north of Wareham, and is under the management of A. D. Makepeace, one of the oldest and most experienced Cranberry growers in the country. This bog is 160 acres in extent. Other bogs in the vicinity belong to the same management. These bogs are all as clean as the tidiest garden. The long and level stretches, like a carpet strewn with white and crimson beads, are a most pleasing and novel sight. Here in early September a thousand pickers camp about the swamps, some in temporary board cabins, but most of them in tents. The manager furnishes the provisions, which the campers cook for themselves, and he rents them the tents. One hundred and twenty pickers constitute a company, which is placed in charge of an overseer, and each company has a bookkeeper. Each picker is assigned a strip about three feet wide across a section of the bog, and he is obliged to pick it clean as he goes. The pickers are paid by the measure, which is a broad six-quart pail with ridges marking the quarts. Ten cents is paid for a measure. There is wide variation in the quantity which a picker will gather in a day, ranging all the way from ten measures for a slow picker to forty, and even fifty, for a rapid one; and in extra good picking seventy-five measures have been secured.

Various devices have been contrived for facilitating Cranberry picking. The Cape Cod growers like the Lumbert picker best. This is essentially a mouse-trap-like box with a front lid rising by a spiral spring. The operator thrusts the picker forward into the vines, closes the lid by bearing down with his thumb, and then draws the implement backward so as to pull off the berries. Perhaps a fourth of the pickers use the implements. Children are not strong enough to handle them continuously, and where the crop is thin they possess little advantage. Raking off the berries is rarely practiced in the Cape Cod region. It is a rough operation, and it tears the vines badly. Late in fall, if picking has been delayed and frost is expected or pickers are scarce, the rake is sometimes used. An ordinary steel garden rake is employed. The berries are raked off the vines, and the bog may then be flooded and the berries are carried to the flume, where they are secured.

This picking time is a sort of long and happy picnic—all the happier for being a busy one. The pickers look forward to it from year to year, and are invigorated by the change and the novelty.

The berries must now be sorted or "screened." If there are no unsound berries, the fruit can be fairly well cleaned by running it through a fanning mill; and some growers find it an advantage to put all the berries through the mill before they go to the hand screeners. A screen is a slatted tray about six feet long and three and a half wide at one end and tapering to about ten inches at the other, with a side or border five or six inches high. The spaces in the bottom between the slats are about a fourth of an inch wide. The screen is set upon saw-horses, and three women stand upon a side and handle over the berries, removing the poor ones and the leaves and sticks, and working the good ones toward the small and open end, where they fall into a receptacle. The berries are barreled directly if they are not moist, but if wet they are first spread upon sheets of canvas—old sails being favorites—and allowed to remain until thoroughly dry.

The cultivated Cranberry is a native of our northern states. It was first cultivated about 1810, but its culture had not become general until forty or fifty years later. The berries naturally vary in size and shape and color, and three general types, named in reference to their forms, were early distinguished—the Bell, the Bugle and Cherry. So late as 1856 there was no record of any particular named varieties aside from these general types. But there are many named sorts in cultivation now. Mr. Makepeace showed me seven varieties in his largest bog.

The common favorite is the Early Black, valuable because it comes in three weeks ahead of the medium sorts. Picking begins upon this variety about the 1st of September here. When fully ripe, the berries are purple-black, and for this reason they are favorites with consumers, for it is a common though erroneous notion that pale berries are unripe. In late fall the foliage of the Early Black assumes a purplish tinge, which quite readily distinguishes it from any other variety.

The Dennis is a bugle berry, of good size, productiveness and bright scarlet color. The fruit is picked late in September and early in October. The foliage is darker than that of the Early Red.

The McFarlin, an oval, dark red berry, is probably the largest late berry grown.

The Gould is a productive pear-shaped berry, of medium season, with a bright purple fruit and light colored foliage.

The Lewis is probably the most brilliantly colored of the Cranberries. It is a very bright glossy scarlet, medium in season and pear-like in shape.

The Franklin is a comparatively new pear-shaped sort, as late as Dennis, purple-red, with a high habit of growth. It appears to have little to recommend it above older sorts.

A new berry which Mr. Makepeace showed me appears to combine more merits than any berry which I have ever seen. Some twelve years ago he observed the original plants in a neighbor's bog, occupying a space about six feet square, and he procured a few cuttings. The small bog which he now has of it is well worth a journey to see. The berries are unusually large, cherry-shaped, a little later than Early Black, and a bright rose-purple. It is probably the largest early berry. I take pleasure in calling it the Makepeace.

It is an arduous duty to subdue a wild bog. The bushes and trees must be removed, roots and all, and it is usually necessary to remove the upper foot or so of the surface in order to get rid of the roots, bushes and undecayed accumulations. This process is termed "turfig." The turf is commonly cut into small squares and hauled off. It is necessary to leave the surface level and even, in order that all the plants may have an equal chance and thereby make an even and continuous bed, and to avoid inequalities in flooding. Although the Cranberry thrives in swamps and endures flooding at certain seasons, it nevertheless demands comparative dryness during the growing and fruiting season. The swamp must therefore be drained. Open ditches are cut at intervals of four or five rods, about two feet deep, and these lead into the main or flooding ditch. It is also often necessary to run a ditch around the outside of the bog to catch the wash from the banks. The areas enclosed within the intersections of the ditches are called sections, and each section is planted to a single variety. The main ditch is usually a straightened creek, or it carries the overflow from a reservoir which may be built for the purpose of affording water to flood the bog. Growers always divert a creek through the bog if possible. In the Cape Cod districts these creeks are often clear trout brooks. The main ditch is strongly dammed to allow of flooding.

Before planting, the bog is sanded. This operation consists in covering the whole surface with about four inches of clean and coarse sand, free from roots and weeds. The chief object of sanding is to prevent too rapid growth and consequent unproductiveness of vines. In wild bogs, the Cranberry rarely roots deeply in the muck, but subsists rather in the loose sphagnum moss. Vines that grow in pure muck rarely produce well.

The sand also serves as a mulch to the muck, mitigating extremes of drought and moisture. It also prevents the heaving of the vines in winter, and it aids in subduing weeds. Every four or five years after the bog begins to bear it is necessary to resand it, in order to maintain productiveness. These subsequent applications are light, however, seldom more than half an inch in depth. The Cape Cod bogs are fortunate in their proximity to the sand.

It was once the practice to plant Cranberry-vines in "sods," or clumps, just as they are dug from the swamps. There are several vital objections to this operation, and it is now given up. It is expensive, the vines are apt to be old and stunted, an even "stand" can rarely be secured, and many pernicious weeds and bushes are introduced. Cuttings are now used exclusively. These are made from vigorous runners and are six or eight inches in length. They are thrust obliquely through the sand, about an inch and a half or two inches of the tip being allowed to project. They are set in early spring, about fourteen inches apart each way. In two or three weeks they begin to grow, and in three or four years a full crop is obtained. The subsequent cultivation consists in keeping the bog clean. A small force is employed during the summer months in pulling weeds. Under ordinary conditions it costs from \$300 to \$500 per acre to fit and plant a bog.

There are those who contend that flooding is not necessary. It appears to be generally held that bogs are longer lived and more productive if judiciously flooded. The reasons for flooding, so far as I know, are five: (1) To protect the plants from heaving in the winter; (2) to avoid late spring and early fall frosts; (3) to drown out insects; (4) to protect from drought; (5) to guard against fire, which sometimes works sad havoc in

the muck. Mr. Makepeace prefers to flood but once a year, unless insects appear in serious numbers. He lets on the water in December and draws it off in April or early in May. Just enough water is used to completely cover the vines in all parts of the bog.

There are many hindrances to Cranberry growing. The chief are spring and fall frosts, hail, numerous insects and some fungous diseases. During the summer season the bogs are not flooded, and insects must be kept in check by insecticides. Tobacco water is commonly used. The liquid is applied with hand pumps from tanks. It is supposed that it has some value as a fertilizer also.

Fifty barrels per acre is a good crop of Cranberries, yet 200 barrels have been produced. The grower usually gets from \$5 to \$10 per barrel of 100 quarts. It does not appear to be known how long a well handled bog will continue to be profitable, but Mr. Makepeace assures me that he knows a bog thirty years old which is still in good condition.—*Professor L. H. Bailey in American Garden.*

New or Little Known Plants.

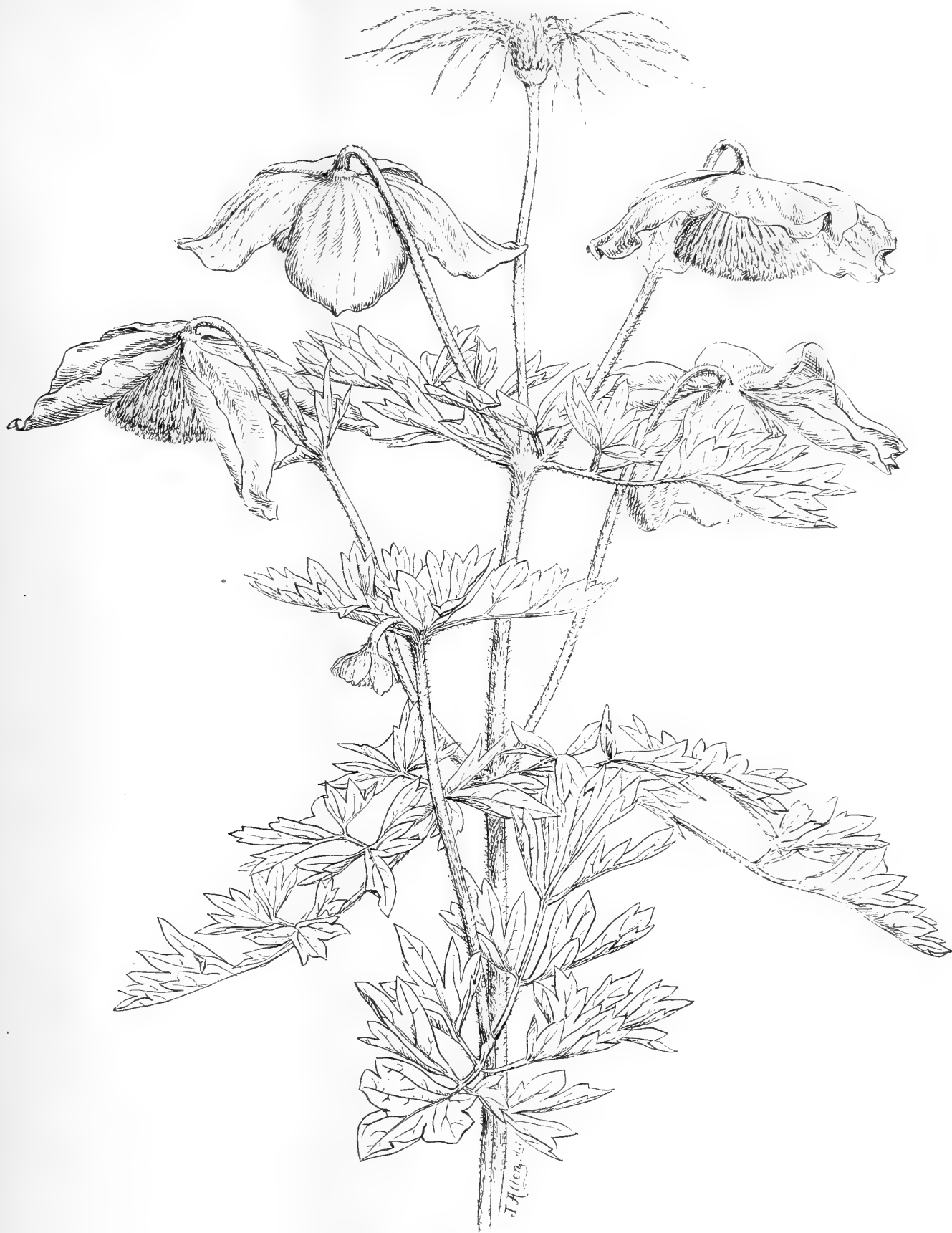
Clematis Stanleyi.

ALTHOUGH discovered about fifty years ago, and figured in Hooker's "Icones Plantarum," t. 589, where it is described as "the handsomest species of an extensive and handsome genus," this Clematis has only recently been introduced into cultivation. It has already been noticed in GARDEN AND FOREST as being in flower at Kew, and our illustration (see p. 513) has been prepared from a plant there. It appears to be not uncommon in the eastern provinces of the Cape; Burke, who collected for Lord Derby, in compliment to whom the species was named, having first found it in Macalisberg. The Kew plants were raised from seeds collected in the Transvaal by Mr. E. Galpin, who described the plant as "a shrubby Clematis, not more than three feet high, with deeply cut silky leaves and large pinkish or pale purple flowers. The fruit when ripe is a beautiful object, as elegant as a bunch of ostrich feathers and silvery white. At first I thought it was an Anemone. It is a very ornamental plant, and may, by crossing it with the garden Clematises, produce a new race."

In a recent communication Mr. Galpin states that the plant is abundant at high altitudes where frost is frequently known, and suggests, therefore, that it may prove to be hardy in England. Some plants placed outside last year at Kew perished in the winter. The best plants are those which have been from the first in a border in a sunny greenhouse. These have grown a yard high, the leaves are almost as silvery as those of the Silver-tree itself, and the flowers have been abundant since the middle of July. A bed of plants in a sunny position out-of-doors has been only moderately successful, the summer weather this year in England having been unfavorable to plants which enjoy sunlight, warmth and not too much moisture. There is every prospect of this Clematis proving a first-rate garden-plant; if it will grow well outside, and flower as well as it does at the Cape, it will be almost as useful as *Anemone Japonica*. The whole plant is clothed with a silky tomentum, which in the sun gives it an attractive silvery sheen. The roots are fleshy, the stems tufted, herbaceous, branching freely from below, erect; the leaves opposite or alternate, six to nine inches long, bipinnate, the pinnæ variable in size and lobing. The flowers are terminal and axillary, the peduncles are six inches long, erect, curved near the top, and each bears one flower, which is two and a half inches across, cupped at first, almost flat before fading, the segments thick and fleshy, broadly ovate, with prominent veins. The color varies from dull purple to rose, and some of the plants are almost white flowered. The stamens are in a large cluster and yellow. Every flower is followed by a head of fruit. The stems are annual, and the plants should be kept on the dry side whilst resting. They start into growth in early spring, and as the first lot of stems flower a second lot is pushed up from the base of the plant, which are in bud ere the first lot of flowers have faded.

Kew.

W.

Fig. 65.—*Clematis Stanleyi*.—See page 512.

New Orchids.

MASDEVALLIA FULVESCENS, Rolfe, is a pretty little species introduced from New Granada by Messrs. Fred. Horsman & Co., of Colchester. It is apparently allied to *M. infracta*, Lindl., but with more brightly colored flowers. These are of a light buff yellow, shading into purple-brown on the con-

stricted sides of the throat. It is described and figured in the *Gardeners' Chronicle*, September 25th, p. 325, Fig. 65.

MASDEVALLIA × *STELLA*, Rolfe, is a very pretty little hybrid, raised by Captain T. C. Hincks, of Thirsk, Yorkshire, from *M. Estrada*, fertilized with the pollen of *M. Harryana*, and which flowered for the first time during the present summer. It is quite intermediate between the two parents, the tall scapes,

the lateral sepals, the color resembling the pollen parent, while the other floral characters, and also the leaves, more nearly resemble those of the mother plant. It is a distinct and elegant little hybrid.—*Gardeners' Chronicle*, September 20th, p. 325.

LELIA × *JUVENILIS*, A. Bleu, is a handsome hybrid, raised from *Lælia Perrinii* fertilized with the pollen of *L. pumila*, in the collection of Mr. Alfred Bleu, of Paris. It is quite intermediate in character, both in the organs of vegetation and in the flower, though in this latter particular the descent from *L. Perrinii* is the most clearly marked. The sepals and petals are of a rosy lilac shade, as are also the side lobes of the lip, while the throat is white and the front lobe of a deep carmine shade. The peduncle bears a single flower.—*Orchidophile*, August, 1890, p. 240, with plate.

LELIO-CATTLEYA × *PROSERPINE*, Rolfe, is a pretty little hybrid raised in the establishment of Messrs. James Veitch & Sons, of Chelsea, by Mr. Seden by crossing *Lælia pumila* *Dayana* with the pollen of *Cattleya velutina*. The flower is over three inches in diameter, decidedly approaching the pollen parent in shape, though with the color, also the habit of the plant, more like the seed parent. It received an Award of Merit from the Royal Horticultural Society on August 26th last.—*Gardeners' Chronicle*, September 27th, p. 352.

CATTLEYA GASKELLIANA PICTA, Rolfe, is a striking variety in the collection of the Right Hon. J. Chamberlain, of Birmingham, in which the petals have a broad central band, with a few radiating branches of light purple on a lilac ground. The sepals are less distinctly variegated with the same colors.—*Gardeners' Chronicle*, September 27th, p. 352.

Kew.

R. A. Rolfe.

The Coco-de-Mer.

THE successful germination of several nuts of the Coco-de-Mer or Double Cocoanut (*Lodoicea Seychellarum*) deserves to be recorded as an event of more than ordinary interest. These nuts have been known to germinate at Kew and elsewhere before now, but they have invariably perished before the first stage of germination was passed. At Kew, however, there is now a plant with a leaf three feet long and nearly as wide, and having a mass of healthy roots, whilst two other seedlings are in a most promising condition.

The Coco-de-Mer is perhaps the most remarkable member of the Palm family. In every character, from its seeds to its gigantic crown of leaves, it is Titanic. For centuries its history was involved in mystery. Its enormous seeds found floating on the Indian Ocean were supposed to be the product of a tree which sailors declared they had seen growing beneath the sea. They were claimed as royal property whenever found, and sold for enormous prices, a ship laden with merchandise having been given for a single nut.

The discovery of the Seychelle Islands in 1743 revealed the true source of these mysterious nuts. Even this, however, did not entirely divest the tree of its supernatural character, for only a few years before his death General Gordon declared his belief that this Palm was the Tree of Knowledge of Good and Evil which stood in the Garden of Eden. The General united an ardent love of plants and considerable botanical knowledge with his military duties, and during several years' residence in the Seychelles, about ten years ago, he made numerous drawings of the Coco-de-Mer, and elaborated his theory that the small island of Praslin, where this Palm is native, was the site of the Garden of Eden. His drawings and notes are now at Kew.

Putting aside all fabulous stories relative to the Coco-de-Mer, and viewing it in its purely botanical character as a Palm, it yet remains a vegetable wonder. Its restriction to two or three very small islands in the Seychelles group, when considered along with its wide difference from all other Palms, gives it a position of the highest importance in geographical botany. The value of its nuts for museums and as ornaments, with the use of its young leaves in basket-making by the natives, threatened its extermination, and it was only when the Linnæan Society made a strong appeal to the Colonial authorities that the danger of its becoming extinct was averted.

The height of the mature trees is from 60 to 150 feet. The trunk is smooth, marked with rings, and about a foot in diameter, except at the extreme base, where it is swollen, onion-like, and surrounded by a hard shell-like covering like an immense socket. The leaves form an enormous crown, each one being twenty feet long by ten feet wide in the blade, and the pole-like petiole proportionately large and strong. The male and female flowers are borne by different plants. The male inflorescence is in the form of a gigantic willow catkin,

six feet long by four inches in diameter. The females are four feet long, and each spike bears from six to ten fruits. These are in the form of huge acorns, and when mature weigh from twenty-five to thirty pounds each. The seed is about a foot long by two and a half feet in circumference. It is deeply two-lobed at both ends and channelled down the middle, so that it looks like two oblong nuts joined by their sides. The nuts are seven years in ripening and about two years in germinating. The trees begin to bear when about forty years old and are said to reach maturity in 120 years.

The germination of the nuts is very remarkable. From between the lower lobes a stout radicle is pushed to a length of about four feet (General Gordon says twelve feet). This thickens to a circumference of a foot or so near the end, where it finally splits to allow the growth of the plumule, which is on the same large scale as everything else in this Palm.

If Kew succeeds in growing plants from these promising seedlings it will be an achievement beside which the flowering of the Giant *Amorphophallus* and the cultivation of the *Welwitschia* will count for very little.

The Palms of the Seychelles are amongst the choicest of those cultivated in gardens. The *Stevensonia*, *Verschaffeltia* and the *Latantias* (not *Livistonas*) are unequalled for nobleness of character. There are large specimens of all the Palms known in the Seychelles at Kew, except, of course, the *Lodoicea*.

Kew.

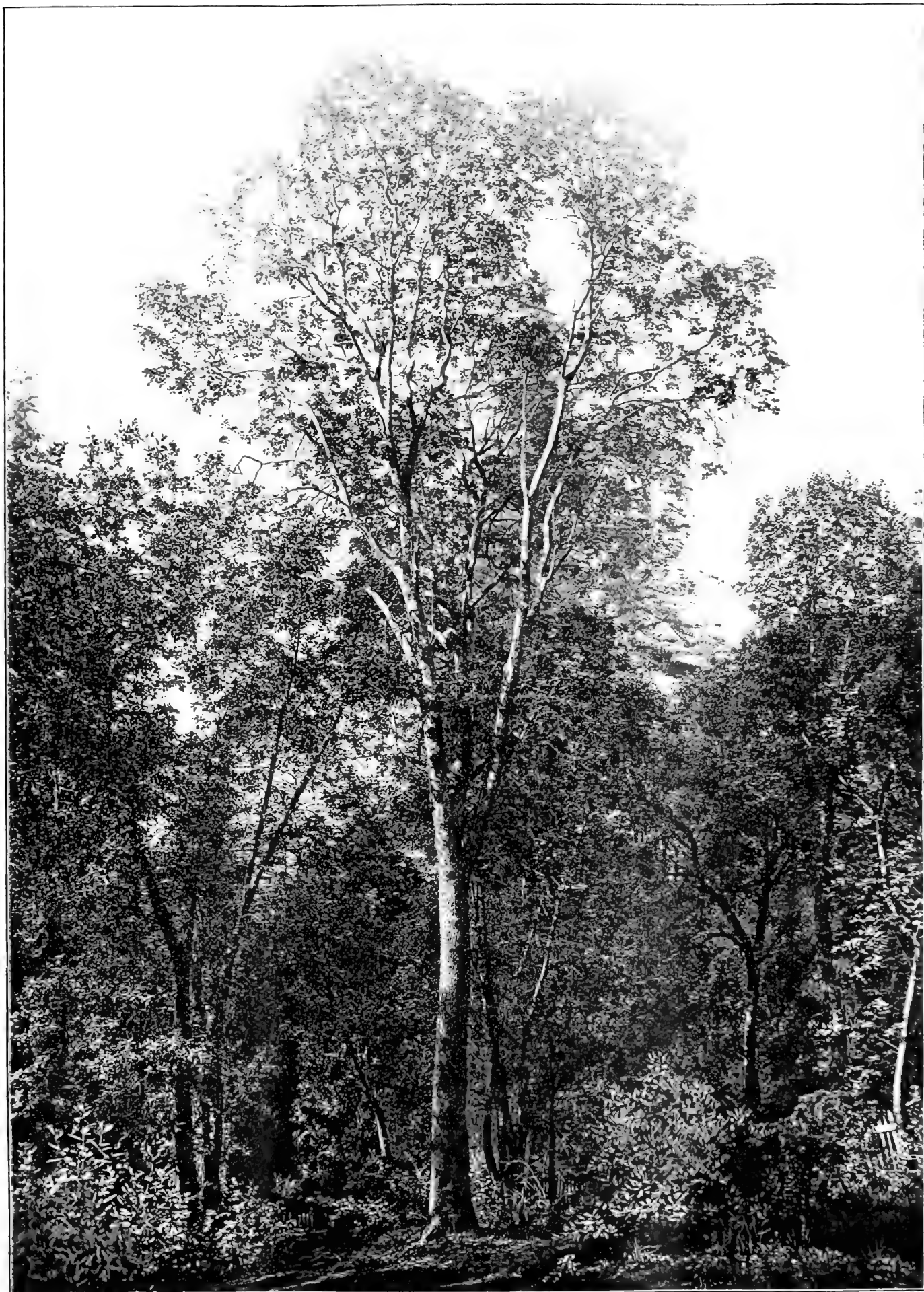
W.

Cultural Department.

Autumn Work in the Hardy-Flower Garden.

WITH the closing up of out-door work no time should be lost in preparing, as far as possible, for next year's display. Those who intend making borders of hardy perennials, or even planting in a limited way, should bear in mind that a border of this description is not for a season only, but that this class of plants are planted to stay and that the preparation must be better than that made for annuals. If the soil be uniformly heavy and retentive, part of the border should be made drier by the liberal application of coarse sand and lime rubbish. Many plants thrive admirably in a dry soil which would not grow in that of a moist nature, and vice versa. The right kind of soil is, therefore, the first consideration. Another point worth remembering is that an herbaceous border, when once planted, should never be disturbed with a spade, except to make changes in it; for even to one understanding border-plants it would be impossible to use a spade among them without injury. It is generally best, in soils of a retentive nature, to stir the surface of the beds in spring, but the use of the fork had better be deferred until the ground is in good condition, and then many of the plants will have started into growth, and may easily be seen and injury avoided. Where plants are to be procured or replanted it should be done at once, before the soil loses more of its warmth, so that the plants may become well rooted before cold weather. At this time the soil is often warmer than the air above it, and it is surprising how newly planted things take hold and establish themselves—much more readily than in spring, when the soil is cold for some time after the air has become warm enough to start into growth plants which are already established. Perennial plants require good soil, as they cannot be dug over in spring for the purpose of working in a fertilizer. The best way to keep them well nourished is to apply a good top-dressing of manure in the fall as soon as growth ceases; a uniform covering of four or five inches will not be too much, as, if the manure is well decayed, so that it may be cut with a spade, there will remain very little to be raked off in spring. When bulbs are planted it is best to have them as nearly as possible together, as these need somewhat different treatment from herbaceous rooted plants. For instance, such bulbs as *Iris reticulata*, *I. Anglica*, the tuberous rooted *Anemones*, Spanish *Iris*, Californian *Lilies*, many Japanese and European kinds, and in fact any rare or tender bulbs, will be the better for a good coat of dry leaves; they should be covered with a spare sash or shutter, taking care to guard against the ingress of mice, which are very liable to make snug homes in such warm quarters. We have found that the best way to get rid of field mice is to soak wheat or corn in a solution of strychnine, the poison killing them at the first taste. In passing, it may be remarked that this has been found the best way to keep mice away from seeds. When first sown in pans we had endless trouble and vexation until strychnine was used.

A short time since it was advised to plant *Narcissus* nine inches deep. I had in mind soil of a sandy nature; but on examining the garden of a friend recently I quite agreed with



The Madroña (*Arbutus Menziesii*).—See page 509

him that Narcissi would not push their way through nine inches of red clay soil. With a wet, heavy soil it is best to prepare a plot for bulbs by adding plenty of sand, using also a good handful at the base of each bulb. Tritonias (Kniphofias), *Arundo donax*, Eulalias, *Anemone Japonica* and any plants of doubtful hardiness should be lifted now and wintered in soil in the cellar; the plants are always the better for it next year if planted out early in newly enriched soil.

South Lancaster, Mass.

E. O. Orpet.

Dahlias.

THERE are no more useful, showy and satisfactory flowers in the late summer and fall than the Dahlias. Continuing in bloom till cut off by the frost, they furnish a constant supply of bold, handsomely colored flowers until the Chrysanthemums come on. Probably no flower has been more subject to popular caprice, for the flower-loving public alternately takes up and discards the various forms. In some gardens the old double forms are still grown, but in most gardens one notes a change to the Pompons, Single, and lately to the Cactus forms. The latter are, of course, merely a reversion to the more natural types and such as readily come from seed. While the very double Dahlias are noble flowers, and mostly of pure colors, there is a formality about them which is not pleasing to many, especially when they are cut with short stems. So common is this habit of cutting that for some years I would not admit the flower to the garden, so firm was the impression of stiffness received from seeing the blooms at exhibitions. Probably many others are as unduly prejudiced. The Pompon Dahlias are a very satisfactory strain. The habit of the plants is dwarf; they are also free bloomers, with small flowers of a very useful size. A few years since some bright cultivator took advantage of the preference for single flowers of all kinds and reintroduced the single Dahlias as a new departure. These are generally brilliant in color and free-flowering, and they at once secured attention, and have become established favorites. Their merits are certainly great, for they are excellent for bouquets, though fading rather soon, and they are showy and free from stiffness. As garden plants they are ornamental, with the fault of bearing too many seed, and the necessity of keeping these cut off makes them somewhat of a care. The forms of single Dahlias now offered are innumerable, and it seems scarcely worth while to name them, as from a packet of seeds sown early in the year a great variety may readily be had. Latterly the Cactus varieties, as the semi-double kinds are called from their fancied resemblance to Cactus blooms, have been finding special favor, because, while free from the formality of the double kinds, they are more lasting, and do not so quickly go to seed as the single ones. Of these, Juarezii seems to remain the best of the dark red or crimson ones, though a somewhat shy bloomer. Constance and A. W. Tait are the best whites; the latter, a variety from Portugal, is an especially distinct flower, with serrated, graceful petals, more resembling a good, full, reflexed Chrysanthemum than a Dahlia. Mrs. Hawkins is a pleasing kind, with cream centre, shading to a delicate salmon-pink. William Pearce is a free, fine yellow. There are numerous varieties of Cactus Dahlias, but the above are kinds which may be had of most growers making a specialty of these plants. Mention might also be made of Gracilis Dahlias, a strain of single flowers with wonderful stripings, spots and variations, and well worth growing from seed.

Newark, N. J.

J.

Notes on Native Ferns.

Aspidium cristatum is a good Fern for cultivation in any light soil that never becomes very dry. A fine loam suits it well, or clay and peat will answer. Its natural home is usually moist, low grounds in a peaty soil. It seems to prefer the sun, and is frequently found near and about old stumps or decaying logs in low pastures or meadows. Its fertile fronds are tall and narrow and die early in autumn. The sterile ones are shorter and often almost survive the winter. Its variety, *Clintonianum*, is a much larger form, and grows mostly in Ash swamps. It is much like the typical species, except in size and in its preference for the shade. It is a handsomer Fern than the true *cristatum* on account of its size.

Aspidium Thelypteris grows in locations similar to those in which *A. cristatum* delights, but is much more abundant. Its stems are usually longer than the fronds. The fronds are of a delicate texture, and quickly wilt when cut, or die with the first frost. It spreads rapidly, and a few plants soon form a thick bed. It will thrive well in shade, but, when growing naturally, the best plants are frequently in the sun. It is one of the easiest Ferns to grow.

Aspidium aculeatum, var. *Braunii*, is a rare Fern, but not so rare as the preceding, nor is it difficult to grow. It seems to thrive in any ordinary garden-soil, in shade, and is a fine plant when well established. Small specimens are the best for planting, and they will soon attain full size. This Fern is found along the margins of cold mountain-brooks and in cool mountain-ravines of northern New York and New England. Its height varies from a few inches in small plants to more than two feet in the largest specimens; the dark green fronds have a chaffy stem.

Aspidium Noveboracense has medium sized fronds a foot or more in length, and three or four inches wide at the middle, from which they taper to both ends. They are of a light green color, thin, wilt quickly when cut and are killed by the first frosts. This species is most commonly found in moist, thickly shaded places, and it requires a light, moist, well drained soil and more shade than most kinds. It is easy to manage when properly placed.

Aspidium fragrans.—The Fragrant Fern is one of our rarest natives, and its natural home is always a peculiar one. It seems to require a situation where it can obtain the very small amount of moisture it needs principally from the surrounding atmosphere. Dry, shaded cliffs are its choice, with an atmosphere rather moist. Among the mountains there are fogs that rise and fall about such cliffs, and where the right conditions, so far as shade, etc., exist, it is sure to grow. But these conditions are rare. At Bolton Falls, Vermont, there are dry, shaded cliffs just above or near the falls. Here this Fern is found, and at a low elevation; for the mist from the falling water is just what is required to cool and moisten the atmosphere, and is no doubt essential to the existence of the plants. On the dry cliffs of the Saguenay River, in Canada, the Fragrant Fern grows larger and more abundantly than in any other place I have seen it. Here the plants are often more than twice as large as specimens from New England. It is a handsome evergreen plant, with numerous fronds from three inches to a foot in length by half an inch to two inches wide. The dried fronds have an agreeable odor, hence its name. I have never grown it, and I judge from its peculiar habitat that it is not easy to manage out-of-doors.

Southwick, Mass.

F. H. Horsford.

The Borsdorfer Apple.

IN discussing the varieties of winter fruit among our imported Russian Apples, the one numbered 402 in the Department list has often been referred to. I received cions of it from Mr. Aaron Webster, of East Roxbury, Vermont, some fourteen years ago, and with it a sample fruit, which exactly resembled a small Ben Davis. Mr. Gibb, in his careful review of the Department list of Russian Apples, printed in the Report of the Montreal Horticultural Society for 1883, quotes what I had written to him of this sample, and gives no other description, though he gives the favorable opinions of Mr. Sias, of Minnesota, and Mr. Tuttle, of Wisconsin, on the hardiness of the tree.

My trees of this variety were planted in an unfavorable place, not only for rapid growth, but also for getting any fruit, being set by the roadside; but I found with the first fruiting that it bore not the least resemblance to Ben Davis. The variety is a slow grower at best and disposed naturally to form a round, bushy head, requiring frequent pruning to produce that openness essential to high coloration of the fruit. This year I have had, and was able to gather, a good number of characteristic specimens; and it happened, as some of them lay upon the writing table before me, that in turning over the leaves of Downing's "Fruit Trees" the name of "Borsdorfer" arrested my eye, and reading the description, I was pleased to find this to be the very Apple in question.

Borsdorfer, as given in Downing, presents the infallible mark of wide distribution and general popularity in the number of its synonyms. In England it has received the names of King George III, Garret Pippin, Queen's and King. In France it is called Reinette Batard and De Misnie, also Le Grand Bohemien Borsdorfer. It has several German names, in all amounting to ten; and Downing, without saying whether it had then been brought to America, calls it "a celebrated German Apple," and gives this description: "Roundish oval, narrowing at the eye; skin pale yellow, with a full red cheek, sprinkled with a little russet; flesh yellowish white, very firm and crisp, with a rich, brisk perfumed flavor; November to February."

This agrees exactly with my Apple in every particular; but Downing omits so many other points which he always gives in describing a fruit he has seen, that it is fair to assume that it first reached this country in the Department importation.

The cavity and basin of this apple are small and shallow, with some russet about both. The stem is slim, and about an inch long. Basin corrugate, calyx closed. A marked characteristic is the large, but not numerous dots, brown on the yellow skin, dark on the colored part. Core medium, seeds short, plump and light colored. The high piquant flavor is notable, even before the fruit becomes mellow enough to be eatable. I think the season will be December to April in New England—and here we have, if not a Russian, at least an iron-clad apple of high quality and a good keeper. Being so fair and handsome, and little, if any, smaller than Fameuse, I do not see why it will not be a good commercial apple. The rather dwarf habit and compact growth of the trees make it a good garden variety.

Newport, Vt.

T. H. Hoskins.

Strawberries.—Character of growth has to be considered in our estimate of Strawberries to a greater degree than has been my practice at least. My favorite late berry is the Summit. But it makes runners so very slowly that I find it hardly possible to keep up a bed of them. On the other hand, Crystal City is such an enormous multiplier that it makes very quickly a solid mat and is unable to produce good fruit. Going over my beds to select what I should call really good growers, making rows readily, but not too rampant, I should select Bubach No. 5, Cumberland and Haverland. Sharpless is on my soil generally a model, but not always; I am obliged to renew them oftener than I like. I can report on the growth of some of the newer berries as follows: Mrs. Cleveland makes fine growth on clay soil; Michel's Early fine; Eureka perhaps better yet; Lady Burk as good. Gypsy makes medium plants, and Crawford, Viola and Warfield are no more than medium. Luella has shown up poorly. Of Thompson's seedlings I have 4, 52, 54, 7, 9, 51. These are all making thrifty growth.

Clinton, N. Y.

P.

Hymenocallis macrostephana is the most robust as well as the most beautiful and fragrant of all the species of the genus. The large, pure white, deliciously scented flowers are arranged in dense umbels raised well above the leaves, which are about two or two and a half inches long, oblanceolate, and bright green, and in themselves exceedingly decorative even when the plant is not in flower. My plant, received a few years ago from B. S. Williams, of London, blooms regularly every year in September. The bulb has attained a large size, but as yet has made no offsets. It is grown in a compost consisting of equal parts of well rotted stable manure, leaf mould and sand. All the *Hymenocallis* in my possession—namely, *H. speciosa*, *H. ovata*, *H. littoralis*, *H. Caribæa*, *H. expansa*, *H. crassifolia* and *H. Galvestonensis*—grow and flower in a living-room as freely as Geraniums. *H. macrostephana* exceeds them all in vigor and in ease of management. The flower-stem, which is thrown up from the heart of the bulb, reached this year the height of seventeen inches, and produced an umbel consisting of seven flowers, each eight and a half inches long, with a cup three inches broad and segments four and a half inches long. Their vanilla-like perfume is so strong that one flower scents a large room and a flowering umbel an entire house. No one seems to know where this species, the best of the genus, comes from. Mr. Baker, of the Kew Herbarium, who has devoted a great deal of attention to the study of these plants, is of opinion that it may prove a hybrid between *H. speciosa* and *H. (Ismene) calathina*. I grow my plant in summer in the open air in a half shady situation, and bury the pot to the rim in coal ashes.

Milwaukee, Wis.

H. Nehrling.

Dendrobium aqueum.—This species has been in cultivation almost fifty years, having been first imported from Bombay in 1842 by Messrs. Loddiges, of Hackney, in whose nurseries it flowered the following year. It extends southward in greater or less quantities along the mountains of the Malabar coast, growing on the trunks of trees and bushes. It is not often, however, that plants are seen in collections, and the reason is difficult to explain, because when well grown *D. aqueum*, or, as it is perhaps more popularly known, *D. album*, presents an attractive appearance. In the beginning of September a fine specimen was exhibited by Mr. T. Statter at the Royal Horticultural Society, and almost every stem bore several white flowers, each one being a half to two inches across, and arranged either singly or in fascicles of two and three. The upper sepal is oblong-acute, the lower ones more or less triangular, while the ovate petals are somewhat broader. The lip is three-lobed, the anterior segment being finely toothed on the margin, and having a downy pubescence on the upper surface,

which is tinged with yellow at the base. The stems, which are more or less decumbent, are from one to two feet long, yellowish green when young and having an oblong-lanceolate, deep green, leathery leaf about three or four inches long at each node.

D. aqueum may be grown equally well in baskets or in pots well drained with clean crocks. The usual compost is rough peat, with a little moss and charcoal added. Plenty of water may be given when the growths begin to develop rapidly, and as much light as possible, without exposing the plants to the direct rays of the sun on very hot days. The temperature in summer during the day-time may range from seventy to eighty degrees Fahr. and a few degrees lower at night, while in winter, when the plants are taking a short rest, a temperature of sixty to seventy degrees Fahr. will be found sufficient until the new growths show signs of breaking.

Isleworth, London, W.

John Weathers.

Hardy Perennials from Seed.—As I have succeeded so much better of late years with seeds of hardy herbaceous plants sown in late fall or winter than when sown in spring, I have determined to sow all the seeds of these plants in November. I shall allow them to freeze and then cover with mats and shutters, and not open them until early spring. I have been led to do this mainly by the uncertain way a large number of species of hardy-plant seeds germinate when sown in spring. Too often we are disposed to say, when seeds fail to come up in six weeks or two months, that the seed is bad; but if we note the straggling way in which many kinds of spring-sown seeds come up all through the ensuing summer, and that many do not germinate in any quantity until the spring following, we cannot help thinking there is a reason. In the case of *Pæonies*, *Hellebores*, *Clematis*, *Cimicifugas*, *Actæas*, perennial *Adonis*, *Thermopsis*, *Petalostemon*, *Baptisias*, some *Pentstemons*, *Liliaceous* plants generally, and *Gentians*, we should conclude that they might better be sown as soon as ripe. These are the worst cases of slow germination; but even in the case of others, which ordinarily come well, I think it better to sow in fall. As it is only by experience that we find just which kinds to sow early in the season, I have decided to wait until freezing weather. *Alyssum saxatile*, *Aubrietias*, *Campanulas*, *Cheiranthus*, *Delphiniums*, *Dianthus*, *Iberis*, *Lychnis*, *Papavers*, *Silenes* and many others if sown before freezing weather would germinate and be lost.

By this plan time is saved. The work of seed sowing in spring is too often deferred, for one reason or another, until well on in March. By that time the sun has attained considerable power, necessitating frequent watering, so detrimental to germinating seeds. I prefer to use square, shallow pans; space is saved, as well as its being easier to divide up the pans for two or four lots of seeds should it be desirable. Ordinary loam, free from manure or other decaying vegetable matter, is best. The finest seeds should not be covered and the larger ones slightly, pressing all down, after sowing, with a brick. Plunge in sand, certainly not in litter or other decaying matter liable to the development of Fungi or the harboring of vermin. There will be no necessity to open, except for inspection, before the middle of February. Then give air every bright day, and we shall be surprised to find how soon seedlings will begin to appear.

A Reserve Garden.—This is a necessity where hardy plants are grown. It may be an experimental garden as well. Odd corners are generally utilized; but a handy square patch, laid out in sections, with water convenient, would be better. Just as soon as any seedlings become large enough to handle they could be pricked off into other pans or shallow boxes, afterward to be transferred to the open ground. It is always a pleasure to know a stock is at hand to fill up gaps in spring. There is no doubt they will occur as long as inexperienced men are employed to "dig up" borders. I have often regretted, through press of other work, having to forego the pleasure of going over the borders myself. I am opposed to digging. An overhauling, or taking of stock, is all that is necessary, except every four or five years, and then trench and replant.

Wellesley, Mass.

T. D. Hatfield.

The Autumn-Bearing Raspberries.—The fact that fruits are most abundant at this season is, perhaps, the reason why Raspberries that fruit in the autumn have not become more popular; and as many amateur fruit-growers may not know that we have varieties of this fruit which bear freely in autumn, I state that a few sorts of the Red Raspberry, under ordinary culture, mature two crops of berries during the season, the first at the usual time for Raspberries, and the second during September and October. The new growth of these varieties commence to bloom late in summer. The fruit from these early

flowers, which are borne near the outer ends of the canes, commences to ripen early in September and continues to mature until checked by hard frosts. A sufficient number of the flower-buds fail to open in the fall to make a fair second crop the following summer. By cutting off the new growth late in autumn or early in the spring the summer crop may be prevented, and a much larger autumn crop is the result. I am now growing a variety called the Erie. At this date (October 9th) it is well laden with fine fruit, and in New York I have gathered ripe fruit from this variety as late as October 25th. Despite the cool weather of the past few weeks the berries have matured rapidly, and are fully equal in flavor to those that ripened on the same bushes in July. The mature fruit remains on the plant much longer in autumn than in summer, and it is not injured by moderate frosts.

It has occurred to me that the autumn Raspberries might have an especial value in northern localities, where the Grape cannot be grown and only the Crab-apple among tree fruits succeeds. By cutting off the stems in autumn the roots could easily be protected during winter, while the flowers coming out at midsummer would not be endangered by frost.

University of Wisconsin, Madison.

E. S. Goff.

Correspondence.

The American Elm.

To the Editor of GARDEN AND FOREST :

Sir.—The illustration of the Feathered American Elm in GARDEN AND FOREST (p. 467) has an especial interest for me, as it calls to mind several handsome specimens of the same class growing on my father's homestead in southern New York. The tall, columnar trunks of these primeval Elms often rise to the height of fifty feet before dividing into branches, yet from the ground they are clothed with numerous tufts of slender, and often drooping, shoots, which, in summer, give to these noble trees a very unique appearance. These tufts often arise from roundish, knotty protuberances of greater or less size, which give the trunk a rugged and picturesque aspect.

On the same farm, until within a few years, stood another venerable American Elm, which, in habit, was the exact opposite of the ones above described. In place of a lofty, towering trunk, with strongly ascending branches at the summit, this motherly old tree divided, at the height of a man's head, into several massive branches, which extended horizontally a distance of thirty feet or more, and finally broke up into slender, drooping spray that literally reached the ground.

I have often queried if these strikingly different habits might not be perpetuated by grafting. I had formerly supposed that the peculiar forms assumed by these trees were due largely to the influence of other trees that grew up with them and have long since been cut away, but observation of the habits of isolated trees that have largely grown up within my recollection do not require any such explanation. Surely no other native forest-tree has a greater tendency to variation in form than the American Elm.

When left to itself, the American Elm often shows a tendency to develop only two, three or four principal branches, which grow out to a great length and often curve downward more or less at their extremities. When grown as a lawn or road-side tree, this habit is objectionable because it tends to make the head unsymmetrical and poorly furnished with foliage, while the long and slender branches are likely to be broken off by winds.

To prevent this undesirable form it is necessary to watch the growth of the young trees and severely head in the shoots that show a tendency to outstrip their companions. This will secure the formation of a number of principal branches, which not only increase the symmetry of the head and clothe it with dense masses of verdure, but enable it to endure high winds without injury.

University of Wisconsin, Madison.

E. S. Goff.

Three Questions.

To the Editor of GARDEN AND FOREST :

Sir.—I have made several attempts to transplant *Cornus florida*, but I have been unable to get my plants well through the first autumn, and after several attempts I have not one well established specimen. Are they difficult to transplant?

Will you kindly give me a complete list of evergreen trees and shrubs, not conifers, which will endure the winters of this region? Will any of the Magnolias, Andromedas or Rhododendrons endure a temperature which occasionally falls to thirty degrees below zero with bright sunshine following?

What perennial flowering plants are better planted in the fall in this latitude, forty-three north? Is this the best time to plant Pæonies?

Whitewater, Wis.

Albert Salisbury.

[There is no particular difficulty in transplanting *Cornus florida*. As is the case with other trees, nursery-grown plants which have been frequently transplanted, and are therefore furnished with plenty of short fibrous rootlets, are more easily established than plants dug from the woods, which cannot be moved except at the sacrifice of a large part of their roots. For this reason it is always better, when practicable, to obtain plants from a good nursery, even although they are considerably more expensive, than it is to undertake to remove them from the woods.

There is probably no broad-leaved evergreen-tree capable of supporting the climate of Wisconsin and very few evergreen shrubs, whose cultivation there must be largely a matter of experiment. *Rhododendron maximum* grows naturally in a region where the thermometer sometimes falls to thirty degrees below zero, but, like the other plants of its family, it cannot be grown in soil impregnated with lime. The Inkberry, *Ilex glabra*, is an evergreen species which grows on the Atlantic coast as far north as Massachusetts, and it might be expected to endure the climate of Wisconsin. *Euonymus radicans*, a climbing evergreen species from Japan, is perfectly hardy in New England, and it should be tried, if it has not been already, in the north-western states. Probably none of the evergreen Andromedas would grow in Wisconsin, where, however, *Magnolia glauca*, which grows as far north on the Atlantic coast as the Inkberry, might be expected to succeed.

Nearly all strong-growing perennial plants can be divided and replanted in the autumn, but it should be done early enough to enable them to make new roots and become established before the ground freezes up. Probably the best time to transplant Pæonies at the north is early in September, as they start to grow so early, especially those having woody stems, that it is almost impossible to transplant them in the spring before growth commences.—Ed.]

Recent Publications.

Two Years in the French West Indies, by Lafcadio Hearn (Harper & Brothers, New York, 1890), contains a number of sketches of Martinique and of its interesting population, which bring before our eyes "Le Pays des Revenants" more accurately and pleasantly than anything which has yet been printed about the most picturesque of the Lesser Antilles.

A tropical forest is indescribable, perhaps, but one may get at least a vivid impression of it from the following sentences which Mr. Hearn has translated from the writings of Dr. Rufz, a Creole of Martinique, and which, as we read them, bring back to us the days we passed long ago in these forests, and all the strange and awful beauty which surrounded us:

"The sea, the sea alone, because it is the most colossal of earthly spectacles—only the sea can afford us any term of comparison for the attempt to describe a *grand-bois*—but even then one must imagine the sea on a day of storm suddenly immobilized in the expression of its mightiest fury. For the summits of these vast woods repeat all the inequalities of the land they cover; and these inequalities are mountains from 4,200 to 4,800 feet in height and valleys of corresponding profundity. All this is hidden, blended together, smoothed over by verdure, in soft and enormous undulations—in immense billowings of foliage. Only, instead of a blue line at the horizon, you have a green line; instead of flashings of blue, you have flashings of green—and in all the tints, in all the combinations of which green is capable: deep green, light green, yellow green, black green.

"When your eyes grow weary—if it indeed be possible for them to weary—of contemplating the exterior of these tremendous woods, try to penetrate a little into their interior. What an inextricable chaos it is! The sands of a sea are not more closely pressed together than the trees are here: some straight, some curved, some upright, some toppling—fallen, or leaning against one another, or heaped high upon each other. Climbing lianas, which cross from one tree to the other, like ropes passing from mast to mast, help to fill up all the gaps in this treillage; and parasites—not timid parasites like Ivy or like

moss, but parasites which are trees self-grafted upon trees—dominate the primitive trunks, overwhelm them, usurp the place of their foliage, and fall back to the ground, forming factitious Weeping-Willows. You do not find here, as in the great forests of the north, the eternal monotony of Birch and Fir: this is the kingdom of infinite variety—species the most diverse elbow each other, interlace, strangle and devour each other: all ranks and orders are confounded, as in a human mob. The soft and tender *Balisier* opens its parasol of leaves beside the *Gommier*, which is the Cedar of the colonies—you see the *Acomat*, the *Courbaril*, the Mahogany, the *Tendre-à-caillou*, the Ironwood . . . but as well enumerate by name all the soldiers of an army! Our Oak, the Balata, forces the Palm to lengthen itself prodigiously in order to get a few thin beams of sunlight; for it is as difficult here for the poor trees to obtain one glance from this king of the world as for us, subjects of a monarchy, to obtain one look from our monarch. As for the soil, it is needless to think of looking at it: it lies as far below us probably as the bottom of the sea—it disappeared ever so long ago, under the heaping of débris—under a sort of manure that has been accumulating there since the creation: you sink into it as into slime; you walk upon putrified trunks, in a dust that has no name! Here, indeed, it is that one can get some comprehension of what vegetable antiquity signifies—a lurid light (*lurida lux*), greenish, as wan at noon as the light of the moon at midnight, confuses forms and lends them a vague and fantastic aspect; a mephitic humidity exhales from all parts; an odor of death prevails, and a calm, which is not silence (for the ear fancies it can hear the great movement of composition and of decomposition perpetually going on), tends to inspire you with that old mysterious horror which the ancients felt in the primitive forests of Germany and of Gaul:

“ ‘Arboribus suis horror inest.’ ”

The following description of the Botanic Garden at St. Pierre will be read with interest. It is the oldest garden in the West Indies, and certainly one of the most picturesque in situation; and although sadly neglected and overgrown, it contains many tropical trees which cannot be seen in any other garden in America to such advantage:

“The garden is less than a mile from the city, on the slopes of the Morne Parnasse; and the primitive forest itself has been utilized in the formation of it, so that the greater part of the garden is a primitive growth. Nature has accomplished here infinitely more than art of man (though such art has done much to lend the place its charm), and until within a very recent time the result might have been deemed, without exaggeration, one of the wonders of the world.

“A moment after passing the gate you are in twilight, though the sun may be blinding on the white road without. All about you is a green gloaming, up through which you see immense trunks rising. Follow the first path that slopes up on your left as you proceed, if you wish to obtain the best general view of the place in the shortest possible time. As you proceed, the garden on your right deepens more and more into a sort of ravine, on your left rises a sort of foliage-shrouded cliff; and all this in a beautiful crepuscular dimness, made by the foliage of great trees meeting overhead. Palms rooted a hundred feet below you hold their heads a hundred feet above you, yet they can barely reach the light. . . . Farther on the ravine widens to frame in two tiny lakes, dotted with artificial islands, which are miniatures of Martinique, Guadeloupe and Dominica; these are covered with tropical plants, many of which are total strangers even here; they are natives of India, Senegambia, Algeria and the most eastern east. Arborescent Ferns of unfamiliar elegance curve up from path-verge or lake-brink, and the great arbre-du-voyageur outspreads its colossal fan. Giant lianas droop over the way in loops and festoons; tapering green cords, which are creepers descending to take root, hang everywhere, and parasites with stems thick as cables coil about the trees like boas. Trunks shooting up out of sight, into the green wilderness above, display no bark; you cannot guess what sort of trees they are; they are so thickly wrapped in creepers as to seem pillars of leaves. Between you and the sky, where everything is fighting for sun, there is an almost unbroken vault of leaves, a cloudy green confusion, in which nothing particular is distinguishable!”

“It is of another century, this garden; special ordinances were passed concerning it during the French Revolution (An. II.); it is very quaint; it suggests an art spirit as old as Versailles or older; but it is indescribably beautiful even now.

“ . . . At last you near the end, to hear the roar of falling water; there is a break in the vault of green above the bed of a river below you, and at a sudden turn you come in sight of the cascade. Before you is the Morne itself, and against the

burst of descending light you discern a precipice verge. Over it, down one green furrow in its brow, tumbles the rolling foam of a cataract, like falling smoke, to be caught below in a succession of moss-covered basins. The first clear leap of the water is nearly seventy feet. . . . Did Josephine ever rest upon that shadowed bench near by? . . . She knew all these paths by heart; surely they must have haunted her dreams in the after-time!”

“The beautiful garden is now little more than a wreck of what it once was; since the fall of the Empire it has been shamefully abused and neglected. Some agronomer sent out to take charge of it by the Republic began its destruction by cutting down acres of enormous and magnificent trees—including a superb alley of Palms—for the purpose of experimenting with Roses. But the Rose-trees would not be cultivated there, and the serpents avenged the demolition by making the experiment garden unsafe to enter—they always swarm into underbrush and shrubbery after forest-trees have been cleared away. . . . Subsequently, the garden was greatly damaged by storms and torrential rains—the mountain river overflowed, carrying bridges away and demolishing stone work. No attempt was made to repair these destructions; but neglect alone would not have ruined the loveliness of the place—barbarism was necessary! Under the present negro-radical régime orders have been given for the wanton destruction of trees older than the colony itself; and marvels that could not be replaced in a hundred generations were cut down and converted into charcoal for the use of public institutions.”

Part IX. of Forbes & Hemsley's *Enumeration of Chinese Plants*, published in the *Journal of the Linnean Society*, has just appeared, and carries this valuable and important work through the *Plantaginæ*, and includes, besides that family, *Acanthaceæ*, *Verbenaceæ* and *Labiataæ*. Two new genera, *Loxocalyx* and *Hancea*, are proposed by Mr. Hemsley. The first is a herbaceous plant discovered by Henry in the Hupch district. It is remarkable in the elongated lower lip of the calyx, and in the very long stalk of the ovary, which is as long or longer than the ripe nutlets. *Loxocalyx* is placed provisionally near *Otostegia* and *Roylea*; a figure of the only species, *L. urticifolius*, is given. There is a figure, too, of *Hancea Sinensis*, the type of a genus detected by Faber on Mt. Omei, and which, Mr. Hemsley points out, resembles in habit, foliage and axillary racemose inflorescence the Japanese genus *Keiskea*, while in floral characters it approaches very nearly to *Gomphostemma*. The genus is dedicated to the memory of the late Dr. Hance, whose investigations into Chinese botany during a long residence at Hong-Kong are well known. The present part contains descriptions of a large number of new species, principally the discoveries of Henry and Faber.

Notes.

A train of ten cars loaded with Lima beans left Ventura County, California, for the east last week.

Mr. Charles Howard Shinn has been appointed Director of the Agricultural Experiment Station in California.

The *Bulletin d'Arboriculture* says that an excellent way to propagate *Hydrangea paniculata* is by means of flower-buds. These should be taken off with a heel when they root readily, and the method is especially useful if it is desired to force small plants quickly into flower for use in the house.

The *Gardeners' Magazine* makes mention of the fact that there is a white *Vallota* in existence. The stock is in the hands of Mr. Thomas S. Ware, of the Hale Farm Nurseries, Tottenham, London, England, who is preparing it for distribution. It will be a valuable addition to our garden plants if possessed of the good qualities which render *V. purpurea* so conspicuous.

A correspondent sends us some unusually fine fruits of the east Asian Orange, *Citrus trifoliata*, ripened in the open air in the Zoological Garden at Philadelphia. These plants, which are said to have been raised from seed collected in Palestine—of course, in a garden—have produced fruit for a number of years. They are in flower early in August, and the fruit is ripe two months later.

Le Moniteur D'Horticulture, quoting from *Le Journal des Campagnes*, describes the process used by French confectioners to reproduce artificially the flavor of strawberries in bonbons and ices. Chemistry, it seems, is able to imitate not only the taste but the perfume of the strawberry in all its delicacy by a combination of butyrate of ethyl, five parts; nitric ether, one part; formiate of ethyl, one part; acetate of ethyl,

four parts; salicylate of methyl, one part. The extract is said to be entirely harmless.

Mr. Sereno Watson continues his Contributions to American Botany, printed in the *Proceedings of the American Academy of Arts and Sciences*, No. 17 of the series having been issued on the 25th of September. It contains miscellaneous notes upon North American plants, with descriptions of a number of new species, and descriptions of new species from northern Mexico, collected principally by Mr. C. G. Pringle in 1888 and 1889. A number of new species and three new genera discovered by Mr. Pringle are here characterized.

The "Adirondack League Club," which owns 93,000 acres of forest-land, is at once to have its property carefully surveyed and inspected under the direction of Mr. B. E. Fernow, Chief of the Forestry Bureau of the Department of Agriculture at Washington, its desire being to preserve and administer its forests in the most scientific way. The example thus set to other owners of woodlands cannot be too highly approved. Nor has the aid of an expert in this special case been sought too soon, if it is true that the club has signed a contract to sell annually for the next fifteen years \$30,000 worth of ripe Spruce timber.

The Manchurian representative of the Tartarian Maple (*Acer Tartaricum*, var. *Ginnala*) is not surpassed by any plant in the beauty of the coloring of its autumn foliage. The leaves appear earlier than those of the native Maples, with the exception of the Red Maple, and assume the most brilliant scarlet tints imaginable, retaining the color for a long time. This Maple has proved one of the most valuable of all small exotic trees for our northern gardens. It is very hardy; the habit is good, and the flowers, an unusual thing in flowers of the Maple, possess a delightful fragrance. It was introduced several years ago into the Arnold Arboretum from St. Petersburg. The largest plants in this country are now eighteen or twenty feet high, and flower and fruit regularly every year.

At a recent meeting of the Geographical Society of Germany, Chief Forest-master Kessler spoke strongly of the waste and recklessness to which the forests of the United States are falling a prey. Even now, as he pointed out, only eleven per cent. of the surface of this country is in forest, as against twenty-six per cent. of the surface of Germany. As our population increases the proportion of wood supply to our needs will, of course, rapidly diminish, but already the destruction of our woodlands menaces not only the revenues which might forever be derived from them, but also the fertility of the soil in many broad districts. It is encouraging to learn that Mr. Merritt, our Consul at Chemnitz, in Saxony, drew the attention of our Government to Herr Kessler's remarks in a recent official report.

In his "Year Among the Trees; or, Woods and By-ways of New England," published about ten years ago, Mr. Wilson Flagg says: "When I am journeying through the country and behold the rocky hills, sometimes for miles in extent, entirely bare of trees and affording too little sustenance to support even a crop of Whortleberry-bushes, where an acre would hardly pasture a single sheep, I am informed by the older inhabitants that these barren fields were since their childhood covered with forest. This wood cannot be restored, because the soil has been washed down from the surface to the plains below, and nothing remains to support a new growth of trees. And then I think, if our predecessors, instead of wrangling about theology, had left its mysteries to be explained by their pastors, and had studied some of the plain laws of meteorology, this devastation had not taken place." Even to-day, we may add, few persons realize that the laws of meteorology, as well as of forestry itself and of commercial conditions, insistently proclaim the necessity of forest-preservation.

Under the McKinley bill a duty of twenty per cent. ad valorem is now levied on "plants, trees, shrubs and vines of all kinds known as nursery-stock" imported into the United States. They were formerly admitted free. "Orchids, Lilies-of-the-Valley, Azaleas, Palms and other plants used for forcing under glass for cut flowers or decorative purposes" are still retained on the free list, and bulbs or bulbous roots not edible, on which a duty of twenty per cent. was levied under the old law, are now placed on the free list. Garden and agricultural seeds, and other seeds not specially provided for, with a few exceptions, still pay twenty per cent. ad valorem, although the following are on the free list: Anise, Canary, Caraway, Cardamom, Coriander, Cotton, Cummin, Fennel, Fenugreek, Hemp, Hoarhound, Mustard, Rape, St. John's Bread or Bean, Sugar-beet, Mangel-wurzel, Sorghum or Sugar-cane for seed, and all flower or grass seeds. These changes are likely to make a

very considerable difference in the horticultural business of the country. The admission of bulbs of flowering plants free of duty should largely increase the importations of these plants and stimulate their cultivation in this country. The duty of twenty per cent. on so-called nursery-stock is likely to have unfortunate results. Some plants, like hardy Rhododendrons, hardy Azaleas, and certain conifers which require special climatic conditions and much skilled labor to produce to the best advantage, cannot be well grown in this country, and the duty must have the tendency of reducing the number of such plants used here. The retention of the duty on greenhouse plants, which, so far as their production goes, come under the same category as the plants already mentioned, is due to special efforts of the florists of the country. The duty will not affect, probably, the production of forest-tree seedlings in this country, and the only result will be to increase the cost to the planter. American nurserymen have already demonstrated their ability to produce better plants of this class at less cost than they can be imported for from any European country. The trade in Roses will probably be benefited by the duty, as it has been the habit of some Continental growers to glut this market yearly with their surplus and generally badly grown stock, which under forced auction sales has demoralized prices and made it difficult to find a market at fair prices for good plants grown in this country or in England.

An interesting bulletin from the Experiment Station of the Kansas State Agricultural College treats of *Experiments with Fungicides for Stinking-Smut of Wheat*. In many localities, in nearly every Wheat-growing country, the crop is more or less injured by this disease. It is not detected until the plants have headed out, and even then it is often overlooked. Before the grain ripens a careful examination shows that certain heads have a dark, bluish green color, while healthy plants present a lighter, yellowish green color. During and after ripening of the grain the smutted heads have a paler appearance than healthy ones. At no time do the smutted heads present the yellowish shade so characteristic of ripening Wheat. When the smutted heads are examined it is found that the grains have become dark and more or less swollen. They are at first of a greenish color, but become brownish or grayish when fully ripened. Because of their being usually swollen, the smutted grains push the chaff apart more than the sound kernels do, giving the head a slightly inflated appearance. If one of the swollen smutted grains be crushed it is found to be filled with a brownish powder which has a very disagreeable and penetrating odor. Often the disease is not discovered till the grain is threshed, when it is recognized by the odor from the smutted grains crushed by the machine. The smut may also be recognized during the milling, both from the odor arising during the grinding and by the dark streaks found in the flour. The dissemination of the disease is brought about by the use of smutted seed. The brown powder lodged in the threshing-machine may infect the seed, or the smut remaining in the field may, perhaps, through the soil, infect the succeeding crop. A summary of the results of the experiments at the Kansas Station, which were carried out by the botanists W. A. Kellerman and W. T. Swingle, shows that the stinking-smut of Wheat is caused by two closely allied parasitic Fungi called *Tilletia foetens* and *Tilletia Tritici*; that these two species of smut differ only in a few microscopic characters, and both produce the same disease, which is spread by spores adhering to the sound grains before they are planted, or, perhaps, rarely by spores present in the soil; that the damage from this disease is often very considerable, sometimes amounting to from one-half to three-quarters of the whole crop; that in ordinary cases the disease can be entirely prevented by soaking the seed fifteen minutes in water heated to 132° F.; that the other fungicides used, when decreasing the amount of smut, at the same time also interfered with the germination, and reduced the vigor of the plants, and that seed from clean fields (if the adjoining fields were not smutty) will produce a crop of Wheat free from smut.

Catalogues Received.

GLENN & DRAKE, Columbus, Ind.; Fruit and Flower Seeds and Bulbs.—HAAGE & SCHMIDT, Erfurt, Germany; Novelties of Seeds and Bulbs.—FRED. W. KELSEY, 145 Broadway, New York; Trees, Shrubs, Roses, Bulbs and Hardy Plants.—SPRING CITY NURSERIES COMPANY, Huntsville, Ala.; Fruit and Ornamental Trees.—SAMUEL C. MOON, Morrisville Pa.; Ornamental Trees and Plants, Fruits, etc.—SCHLEGEL & FOTTLER, 26 South Market Street, Boston, Mass.; Seeds, Bulbs, Roots, etc.—JAS. M. THORBURN & CO., Fruit, Vegetable and Flower Seeds.—THOS. S. WARE, Tottenham, London, England; Tree and Herbaceous Pæonies.

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The Improvement of Trees.

IMMENSE progress has been made, certainly, in the last two hundred years in collecting facts about the trees of the world and their utility to man, and much has been done toward determining the best methods for their cultivation and something for their improvement. There is still, however, much work of practical value to be accomplished by the scientific dendrologist, whether his investigations are directed to the improvement of forests or to the study of trees from the gardener's point of view.

Trees useful primarily for the production of timber require long years, some of them centuries, in which to complete the cycle of their existence. The observer who records his investigations on the seedling Oak or Pine cannot hope to do more than see the seedling become a vigorous young tree. Then another man must take up the investigation where the first dropped it, and so on from generation to generation of men until the tree has lived out its long existence. The difficulty of careful and sustained observations made on growing plants increases immensely as their period of individual life is lengthened; a man who is ready to undertake the most minute and difficult investigations in plant life whenever he feels that there is a chance of his reaping a reward during his own life, hesitates naturally when he knows that his work can only be finished, if finished at all, by unknown hands. This, perhaps, is the reason why fruits and vegetables and flowers have been improved by selection and hybridization, and why the selection of individual trees to be grown for timber is still left largely to chance.

It can hardly be doubted, however, that trees, whether grown for timber or for ornament, can be improved by methods similar to those which have been used for the development of our modern fruits and vegetables, and that the time must come when the same attention will be paid by scientific foresters to the improvement of races of timber-trees as is now paid to the improvement of plants of far less importance to the human race.

There are certain individuals of every species of plants which, for some reason or other, grow more vigorously

than others or possess other exceptional qualities. This fact has been taken advantage of to establish new races of garden-plants, but in the case of trees it has been too generally overlooked, and sufficient attention has never been paid to the selection of the seed-bearing parents, the mothers of future forests. The whole question of the improvement of trees, whether as producers of timber or merely as ornaments of gardens and parks, is still before us. Humbler plants often gain hardness by the mingling of the blood of allied species, and what little has been learned of the few natural hybrid trees known to exist shows plainly that it is within the bounds of possibility to produce trees artificially by hybridization which may possess certain qualities to a greater degree than either of their parents. Then there is the whole question of the relation of the stock to the graft as applied to the production of timber-trees to be investigated. It is known that certain trees, when it is desirable to produce them under certain conditions, grow much more rapidly and vigorously, while young at least, if they are grafted, than they do on their own roots; but time and careful observations are needed to determine what results, from economical points of view, will finally be obtained by such a method of propagation.

All such questions as these are matters which must one day occupy the attention of scientific foresters, and which can only be solved at well equipped forest-stations, which all governments, following the example of Germany, can wisely establish; for without the stability which governments alone can give, scientific observations, demanding a longer period than the life of one generation of men, are apt to be barren of useful fruit.

Such thoughts naturally lead us to consider whether it is not possible to increase the number of ornamental trees to be grown in any particular region and the beauty of individuals by the application of the same rules of selection of seed from exceptionally fine individuals as we now employ in producing cabbages or radishes. This seems such an evident proposition that it requires no argument to support it; and yet how few persons who raise trees from seeds pay the slightest attention to the character or health of the individual which supplies them. For the ordinary collector of tree-seeds in the nursery or the forest a seed is a seed, and the fact is ignored or forgotten that the constitutional weakness of an individual plant can be transmitted through its seed. Neglect to properly select the seed-parent is doubtless the cause why many nursery-grown trees fail before their time, and why seedlings raised from trees subjected in cultivation to more or less unnatural conditions are less desirable than those raised from individuals growing spontaneously under the most favorable natural conditions.

The possibilities of tree-culture widen when it is considered that there are certain species which possess a much greater power than others of adapting themselves to their surroundings—that is, which possess greater constitutional flexibility. Such species are able to exist over wide areas through individuals being able to support greatly diversified climatic conditions. If this fact is taken advantage of and trees for any particular region are raised from seed grown in a climate as similar as possible to that where the seedlings are to be planted, these may be expected to adapt themselves to their new surroundings more readily than if the seed-parent had grown in a less favorable locality. This is shown by the familiar instance of the Douglas Spruce. This tree is widely distributed in western America from British Columbia to Mexico, and eastward to the eastern base of the Rocky Mountains. It was first made known from the neighborhood of Puget Sound, where the climate is mild and humid. Plants raised from seed collected there grow well in England, where the climate is not dissimilar to that of our north-west coast; but when these plants were brought from England to our eastern states they failed entirely. Many years later this tree was found in the Rocky Mountains in a severe climate, and seeds from the Colorado trees were planted in New England, and have proved abundantly hardy and in every way

satisfactory. This is true, too, of another widely distributed western tree, *Abies concolor*, which is hardy in the east when grown from seed gathered in Colorado, but only precariously hardy when the seed-parents have grown in the milder climate of the California Sierras; and it is doubtless true of all trees which have a wide north and south distribution or which grow from the sea-level up to high elevations. *Magnolia glauca* grows from Massachusetts to Florida and Texas; it is as hardy at the north as at the south, and yet no one can doubt that seedlings of this tree raised from seed gathered in Florida would produce plants which would succumb in Massachusetts during their first winter.

The study of trees with relation to their distribution and the peculiar conditions with which certain individuals of the species are surrounded is full of possibilities, and promises to greatly increase the material which can be grown in regions of severe climate. Professor Budd has already shown, by means of the useful experiments with Russian and central Asia plants which he has been carrying on in Iowa for a number of years, that individuals of many species vary remarkably in their power to adapt themselves to severe climatic conditions; and the work which has already been done in this direction can be greatly extended in the case of many of our own southern trees, which can probably be cultivated further north than is now believed possible through the selection of seeds from individuals grown at the extreme northern point of the natural distribution of the species. This is true, too, of the trees of Japan and China, where many species range north and south through as many degrees of latitude as separate Massachusetts from Florida. Many of these Asiatic trees, as we know them here in cultivation, fail because they have not always been derived from the best regions so far as climate is concerned. Even European trees, which Americans have usually obtained from England, have not always had a fair trial here, and which, had their seed-parents been selected from regions of colder or drier climate, might possibly have been able to adapt themselves to ours. We may even obtain a Cedar of Lebanon, the ambition of most American tree-planters, which will flourish in the extreme northern states, if some one will take the pains to obtain seeds from the right place. The old Cedars of England came originally from the famous grove on Mount Lebanon, which is near the southern limit of the area occupied by the species, and the plants which we have tried in this country, and which have failed with us, were raised from these English trees or from seeds gathered on the Lebanon. But in recent years the range of the species has been extended, and now it is known that this tree forms extensive forests on higher and more northern mountains than the Lebanon, in a region which furnishes trees like the Cilician Fir, which flourishes in New England better than most Firs. It is evident, therefore, that if we are ever to have a Cedar of Lebanon experiments must be made with seed gathered at the northern limit of its range; and what is possible of the Cedar of Lebanon is possible, perhaps, of the Cedar of the Himalaya and of a hundred other trees which could be mentioned, and which we consider unsatisfactory here because they have never had the best trial possible with reference to our climate.

It is by making such experiments as these that arboreta, botanic gardens and our agricultural experiment stations can do practical and useful work.

Alphonse Karr.

ALPHONSE KARR, who recently died at Nice in his eighty-third year, was the son of a German musician, but was in heart and soul a child of the Paris where he was born. Not an act of his varied life seems to have shown, and not a line he wrote reveals, the presence of Teutonic blood. There is no need to explain the purely Gallic character of the novels which early made him famous. Even their sentimentality, though it seems alien to the France of to-day, is of the sort which characterized the France, not the Germany, of two generations

ago. Nothing could speak less of a Teutonic spirit than the fact that he edited the *Figaro* for a time and established it upon the lines it still follows to-day. Purely Gallic, too, is the quality of his style—graceful, light, brilliant, digressive, shot with that kind of wit which is biting yet never bitter, and, whether sarcasm or sentiment is its theme, never passing the bounds of literary good taste. I cannot discover his mother's name, but she must surely have been a Parisian and he must surely have been her very own.

Even in his early books signs appear of that love for Nature which led him to adopt horticulture as a profession, when, disgusted with Paris after the revolution of 1848, he established himself at Nice. But it was three years before this date that he published the "*Voyage autour de mon jardin*," which is likely to outlive any of his other books, and the memoirs which he afterward wrote, under the title of "*Livre de bord*," relate only to his Parisian experiences. So there are no data from his own pen, except in the numerous articles he contributed to garden periodicals, from which an account of his practical horticultural experiences might be gathered.

However, this does not seem to be a matter of great regret, for the cast of his mind was not scientific, so it is doubtful whether much that is definitely instructive would have marked a chronicle of his later years, and the very best that he could have given us in the way of sentimental, poetic and half-humorous writing about plants is surely embalmed in his charming "*Voyage*." No one but a Frenchman could have written this book, and no one should read it who cannot appreciate the quality of Gallic wit and humor, and see the difference between their statements and those of sober, common-sense intelligence. But for persons who can grasp his point of view, even if they stand among the ranks of the scientific men or of the narrow, impassioned horticulturists whom he satirizes with equal gusto, the "*Voyage*" is most delightful reading. They realize, as one reviewer has already said, that when Karr makes fun at the expense of botanists it is as Molière made fun of doctors; and will believe that, as Molière probably was quick to call in a doctor when he needed him, so Karr really appreciated the debt the world owes to science, and even to scientific terminology, the red rag at which he tilts with most delight. Gay humor infuses every satirical line that he writes; when his words take a serious turn it is to praise the works of God, not to castigate the follies of man.

His "*Voyage Around My Garden*" was inspired, he tells us, by envy of a friend who was starting off on a long journey; and it is cast in the form of letters to this friend, begun when he first realized, looking out on his little domain, how easily and agreeably he could travel there, and prolonged until he works himself into a state of contempt for those who choose to go farther and fare worse. There is neither continuity nor system to these letters, and they touch on a thousand topics suggested by something in the garden, but in no sense really connected therewith. The first describes a magnificent sunset, the second a battle between spiders on the garden wall, and the next the superiority of a turf-carpet over the products of even oriental looms, while the fourth passes from birds to Marie Antoinette and Danton. Insects and savants, the difference between formal and genuine ownership in the works of Nature, the true meaning of happiness, the folly of liking tobacco (pointed by an acknowledgment of his own love for the "poison"), fables and anecdotes with flowers or lovers of flowers for their heroes, enthusiastic rhapsodies over one favorite plant or another, and jovial tales of the follies of eccentric amateurs—these are but a few of the themes he treats with infallible delicacy of thought and expression, and with equal charm whether serious sentiment or sarcastic fun-making be his mood. In one chapter he tells us how we live in the midst of death—surrounded by dead vegetable matter, feeding on dead animals, and made comfortable and happy by the hands of long-past generations; in another he describes how his garden was ravaged by an unwelcome guest with a gun and a frantic dog, and it is hard to say which is the more attractive. One day he follows the course of the seasons by recounting how they change his little garden; another time he shows how its aspect varies during the course of twenty-four hours. Now he lies on his back in the grass and reports what he sees; then he turns over on his face and continues the chronicle. A delightful chapter tells how we might have accurate names for all the shades in the long scale of colors if we would only study common flowers and draw our terms from them. Here he tells of an old-time lover of Pinks who grew them in ivory boxes and fastened them to ebony sticks with rings of silver; there we have the history of a man who lost his fortune of 300,000 francs, as well as his peace of mind, all because a friend had seen fit to present him with

twelve Tulip-bulbs of no particular value; and again, *apropos* of the story that when Jove turned Io into a heifer he invented the Violet that she might have suitable food, he declares his intention of making a lawn exclusively of Violets. The sparkling persiflage which is the salt of the book is not spent on scientific men and Tulip-growers only; the poets come in for their share. While botanists have made flowers dull and tedious and florists have made them ridiculous, poets have vulgarized their beauty and distorted their sentiment by the constant repetition of trivial or misleading phrases. The Greeks, he declares, said five or six pretty things about the Rose; the Romans translated these and added three or four more; and later poets of all times and lands have repeated them all, without adding anything fresh, until we are bored to death by their reiteration. Equally tiresome and more foolish is the way poets introduce the name of a flower simply because it gives them an easy rhyme. How often, for instance, do they speak of the *Gladiolus*, simply because it rhymes with the Linden (*glaioul* and *tilleul*), making the flower, most often, grow beneath the tree where no human eye has ever seen it. He gets quite excited over the traditional but wholly fictitious love of the butterfly for the Rose, and nothing could be more amusing than the grave way in which he demonstrates that the Violet is anything but "modest," as poets invariably assert. But to give a sample of everything the "Voyage" contains would simply be to translate the book. Suffice it to add that, while we can gather from it no facts of genuine horticultural importance (it really contains more facts about insects than about flowers), now and then we come upon a stray word which shows the difference between his time and ours. Madame Hardy was then a novelty among Roses; yellow Poppies, he says, were as impossible to find as green or blue ones, and he had never seen a red one streaked with white; he pronounces green Roses a foolish fiction, and says that, despite the great beauty of Pæonies, they are despised by horticulturists and the rich, and grow only in poor folks' gardens. In short, it is a book to charm the lover of Nature in a general way and the lover of graceful and brilliant writing—not a volume for serious students. What we admire most as we close it is "the exquisite delicacy of the senses," which he does not hesitate to boast about himself, and the easy mastery of word and phrase which shows on every page.

The *Livre de bord* is also delightful in its way, which is distinctly anecdotal. And here, too, we occasionally get brief glimpses of his passionate love of flowers. He tells us in one place that before he left Paris he came very near engaging to write a large horticultural dictionary "on a novel plan." He could not have helped making it charming, but we may well doubt whether the world is much poorer in knowledge through its abandonment. In another place he relates how he once formed a "Romancer's Garden" by collecting the queer references to plants and flowers which he chanced upon in the writings of his day. In it he planted a blue Carnation, discovered by Janin; a Chrysanthemum, likewise blue, which George Sand had possessed; a Camellia "of intoxicating perfume," invented by Rolle; a black Tulip belonging to Dumas, a climbing Azalea for which Balzac was responsible, and very many flowers which had bloomed out of season in the grounds of Eugène Sue and other romancers. It was for the compiling of catalogues of this sort, not of prosaic dictionaries, that Alphonse Karr was born. Yet he seems to have known how to grow plants so as to please the buying public as well as to delight himself, and we are glad to think of him spending his long last years—fully half his patriarchal life—solely occupied in gardens under the delicious sky of Riviera.

New York.

M. G. Van Rensselaer.

Max Leichtlin's Garden.

IT is twelve years since I first visited the far-famed garden of Herr Max Leichtlin, at Baden, and though I have more than once attempted to describe it in the *Gardeners' Chronicle* there is always something new to be said. Within a few years it has been increased in size, but it is still far too small to contain the fine plants and bulbs which are brought together from all parts of the world through the skill, liberality and ardor of its owner. There must be something in the climate of Baden which is very favorable; for, although in winter the frost and snow are quite as severe, or even moreso, than in the midland counties of England, and in summer the heat is usually greater, plants from such varied localities as Asia Minor, South Africa, Chili, Sikkim and California all seem to succeed equally well. This, in some instances, is no doubt due to the special provision

made for their culture, and in others to the fresh soil which is frequently renewed in the numerous frames and beds.

Any one who has cultivated a large number of small bulbous plants in close proximity to each other knows how hard it is to keep them from becoming intermixed and to find room in suitable positions for the accessions which are constantly coming in. Herr Leichtlin has always been, and is now more than ever, an advocate for rigid selection, and he will grow nothing that is weedy, of bad habit, or easily increased by ordinary cultivators, but devotes his attention as a propagator and a hybridizer only to such plants as are new, rare or difficult to manage. He annually throws away many plants which would be highly prized by less intelligent collectors. But he never forgets a really good plant, and spares no effort to secure and prove the value of every species in any genus for which he has a special liking.

The practical experience of Herr Leichtlin during thirty years of gardening would make a work of interest and value to the botanist as well as to the gardener. This is specially true with regard to hardy plants. The feature of his garden at this time are Irises, which he has lately introduced from Asia Minor. Though but a few of these plants were still in flower on the 17th of May, they were worth a journey to see. The first plant which attracted my attention on entering the garden was a good specimen of *Ferula Narthex* in full flower. This has been sixteen years in attaining sufficient strength to bloom, and though not a showy plant, it is a very striking one. The branches when broken exude a white sap which produces the drug known as assafœtida, and which, though so unpleasant in its smell, is, when judiciously used by a skilled cook, an agreeable and valuable ingredient in many dishes. The next wonder was *Iris Lorteti*, a very rare and splendid species allied to *I. Susiana*, but much more beautiful in color, and seemingly difficult to cultivate. *Iris Gatesii*, from Asia Minor, is of the same section, but even finer, and seems much more amenable to cultivation. It was sent out for the first time this summer. *Iris lupina* and *Iris paradoxa* are two species rivaling *Masdevallia Chimera* in beauty of structure and delicate, though not showy, coloring. Long beds of *I. Bakeriana*, *I. Bornmulleri*, which is supposed to be the same as *I. Danfordia*, *I. Persica purpurea* and several others, though now long past bloom, and in many instances ripening seed freely, must have been a splendid sight in the winter, when they braved the snow and frost with impunity. Fine varieties of *I. Korolkowi*, *I. Iberica* and many others were either flowering or just about to flower, and quantities of labels without names showed that many surprises are in store.

Herr Leichtlin, like all good bulb-growers, takes up annually almost all bulbous and tuberous rooted plants which have not some special peculiarity; he also puts glasses or lights over many things in order to ripen them more thoroughly and to protect them from the frequent thunder storms which prevail in this valley. The collection of Nerines and Kniphofias is quite unrivaled, and many seedlings are being raised both from selected plants of the best species in these genera and from crosses made between species which appeared capable of improvement in color or habit. It is delightful to see that however small, insignificant or difficult to manage a plant may be, every care is given it, provided it belongs to a good genus or has anything to recommend it. Many plants which have been lost almost everywhere, are to be found here awaiting the discovery either of the secret of their propagation or the introduction of something better of the same character. Among other beautiful or curious plants which I saw were *Jankaea Heldreichii*, allied to *Ramondia* and one of the rarest of European alpine, which had been procured with great difficulty from Mount Olympus in Thessaly; *Geranium Balkanum*, with fragrant leaves and pretty, deep rose colored flowers freely produced; *Onosma albo-roseum*, with hoary, grayish leaves, and numbers of flowers, which are white when first opened, but change to rose color afterward; *Gladiolus Kotschyannus*, a fine hardy species, quite unique in color; a wonderful double Tree Pæony of a deep lake; a very fine white *Aquilegia*, *A. Californica alba*, which, though self-sown, was flowering beautifully in the chinks of the large stones with which the narrow terraces are faced. This system of terracing, very similar to that adopted by vine-growers on rocky hill-sides, is calculated not only to combine depth of soil with thorough drainage, but to accumulate and store up all the sun heat possible. It may not be so picturesque as the ordinary English rock-garden, but for growing many plants which will not thrive in a flat border it is more effective; the species are much more easy to keep separate than when they are divided only by small pieces of rock or stones. I observed a small covered jar placed beside the plants, the seed of which was ripening; this was

intended to attract the attention of the gardener as he might pass and remind him to gather the seed as fast as it ripens without bringing it in-doors. Herr Leichtlin complains, with justice, of the practice in many botanic gardens of keeping valuable seeds for months before distributing them. It is well known that many seeds if not sown in autumn, or as soon after they are ripe as possible, will either not germinate at all or not until from one to two years after planting, long before which time the pots or pans in which they are sown are covered with moss.

If Himalayan collectors, especially, would remember this, we would not have to lament the repeated failure to grow such fine plants as *Primula Elwesiana* and *Gentiana stylophora*, which at present are two of Herr Leichtlin's special desiderata. I found that though he may not be able or even willing to imitate the natural conditions of plants, he is always desirous of knowing as much as possible of these conditions. And he agrees with me that a knowledge of physical geography in connection with plant distribution is highly useful. It is a curious and a gratifying fact that Herr Leichtlin seems to have more correspondents, and to find more gardeners of congenial tastes in England and in the United States than in his own country. I would advise any one who may have a really fine, new or rare and possibly hardy plant which he cannot propagate, to send it to him.

Preston, Cirencester, England.

H. J. Elwes.

October in the Pines.

NO frost has yet touched the Pines, and the flowers and foliage were never more beautiful than now. The ripened leaves of many shrubs and trees are as handsome as gaily colored blossoms. The flowers linger, many summer-blooming plants throwing up side shoots from the old stems.

In my wild garden, where I am trying to imitate Nature in the Pines, blue Violets are in blossom, and so is *Oxalis violacea*, as if trying to blend spring with autumn. Most of the Golden-rods have faded, but *Chrysopsis Marianna* is still beautiful, and some of the wild Sunflowers are a mass of bloom. The wild Asters are charming. *Aster Nova Anglia* is in its prime. In a damp spot in the Pines I came across a variety with rose-colored flowers which were more beautiful and showy than those of the normal purple color.

The water in the shallow, muddy ponds and bogs is still warm enough to keep the Pond Lilies in bloom. But there are no flowers on any other water plants except *Utricularia*.

The foliage of the rare local *Helonia bullata* is beautiful now. Parting the thick clump of glossy, shining leaves, I find the embryo flower-buds. Last spring there were no blossoms. Owing to the mildness of the winter the flower-stems started up in February and March and were cut down by frost. The leaves are evergreen, and grow in a thick mat, as if to protect the incipient flower-buds; but the flower-stem is very tender, and as it is sure to push up on the first mild days of spring it is almost as sure to be nipped by frost.

The foliage of the Sweet Gum (*Liquidambar*) makes a fine appearance during these mild October days. Some of the trees are of a purple shade of color—deep, dark purple on the upper surface of the leaves, but on the under side still green. Others have yellow leaves; but the larger proportion of the trees have red leaves, in varying degrees of intensity of color. I have noticed year after year that each tree always takes on the same color. For instance, if it is yellow one year, we may be sure that it will be the same ever after.

But the charm of the Pines at this season is the Tupelo (*Nyssa aquatica*). Its bright crimson foliage and its peculiar habit of growth—flat, spray-like branches—make it pre-eminently the queen of the region. It does not take kindly to transplanting. I have made several attempts to have small young trees transferred to my garden, but they have all died, some quickly, others gradually. But the tree is worth many more trials, and I still hope for final success.

The next best thing in this latitude in the way of autumnal coloring is the *Sassafras*, which is a rapid grower. Like the *Liquidambar*, the trees vary in tints—some take on yellow, others red. A group of a dozen or more in my garden are now all ablaze in bright orange-red.

The deep green Hollies mingling with these bright colors make charming pictures. There are places here and there in the Pines of such wonderful beauty at this season that no words can do them justice. Less than thirty years ago this town, with all its outlying farms, was covered with a growth of some of the most beautiful trees and shrubs. These were all cut down, and attempts made to grow ornamental trees from the nurseries, many of which are a complete failure. Vineland is a standing proof of the blindness of our people to

true artistic surroundings. From the teachings of GARDEN AND FOREST the more cultured class are beginning to see the mistake; but many of these trees, like the Oaks, and especially the Holly, are of such slow growth that our impatient people, who want quick results, are deterred from replanting.

On the place which I now occupy, several Hollies were planted twenty-five years ago. The largest is less than fifteen feet in height, about twelve feet across the lower branches, and fifteen inches in girth. The trees had not been cared for and had been badly mutilated. The lower branches had been trimmed off four and five feet from the ground, and many of the remaining branches had been broken for winter decorations. A near neighbor planted a Holly-tree about the same time that these were set, and this one tree is worth more than my seven. Its branches touch the ground, and it has been headed back just enough to make it symmetrical without giving it a stiff appearance. It measures nineteen inches in girth, and is about eighteen feet high and fifteen feet broad. It is far more beautiful and effective than a group of Norway Spruces which stand a little distance from it.

Vineland, N. J.

Mary Treat.

New or Little Known Plants.

Two American St. Johnsworts.

THE genus *Hypericum* contains a number of shrubby North American species of considerable value as garden-plants. They are little known, however, to gardeners, and a few, at least, have probably never been cultivated. All the plants of this genus have bright and abundant golden yellow flowers, and the fact that they bloom in midsummer or in early autumn when other shrubs are not in flower, and that they continue to produce their flowers in succession during several weeks, adds to their interest and value. *H. aureum*, of which a figure was published in this journal (vol. ii., p. 185), is a small ornamental shrub of the first class from an ornamental point of view, which was introduced into gardens a few years ago through the Arnold Arboretum. *H. Kalmianum*, figured on page 112 of the present volume of GARDEN AND FOREST, is an older inhabitant of gardens. It was discovered on the banks of the Niagara River, one of the few stations where it is known to occur, by the Swedish traveler Kalm, who visited America about the middle of the last century; and it is 130 years since it was first cultivated in England. Like many of the plants of the eastern part of this continent, which were much sought after and valued by gardeners 100 years ago, it was afterward neglected with a change of fashion in gardening, and finally forgotten outside the limits of a few botanic gardens. It is getting to be understood, however, now that some of the most beautiful trees and shrubs belong to our eastern flora, and that they are the safest and therefore the most desirable plants to use in this part of the country; and American *Hypericums*, like the *Viburnums*, *Dogwoods*, *Roses* and other eastern American shrubs, now seem destined to gain the place in American gardens to which their hardiness and beauty entitle them.

Figures of two of the shrubby *Hypericums* appear in this issue, *H. prolificum* and *H. densiflorum*, and it is proposed to figure from time to time such of the other little known species as are likely to prove desirable as garden-plants.

*H. prolificum** (Fig. 66) is a stout, bushy plant growing to a height of three or four feet by as much in diameter, with stout erect stems and branches covered with light red-brown bark separating readily into thin scales, and slender two-angled branchlets. The leaves are nearly oblong, obtuse or acute at the apex, terminated by a minute mucro, and narrowed at the base. The numerous flowers, which are often an inch and a half across, are produced in great profusion in single or compound terminal clusters. They open in succession and continue to appear almost continually from July to September.

H. prolificum is not a rare plant, and is widely and quite generally distributed from New Jersey to Minnesota and

* *Hypericum prolificum*, Linnæus, "Mant.," 106.—De Candolle, "Prodr.," i., 547.—Coulter, *Bot. Gazette*, xi., 24.—Watson & Coulter, "Gray's Man. N. States," ed. 7, 93.

southward to Alabama and Arkansas. It was cultivated as long ago as the middle of the last century; but when found now in European gardens it appears to be grown under the name of *H. Kalmianum*. It has inhabited the Arnold Arboretum for several years, having been first received from Woolson & Co., of Passaic, New Jersey. It is perfectly hardy here, grows rapidly in ordinary garden soil, and flowers regularly and profusely every summer.

H. densiflorum † (Fig. 67) is a rarer and less known plant than *H. prolificum*, to which it is closely related. It attains a height varying from two to six feet, with stout stems divided above into many slender erect branches covered with leaves which are linear-lanceolate, with slightly revolute margins, and which are tipped with short stout mucros. The numerous flowers, which are rarely more than half an inch in diameter, are crowded in broad, compact cymes. The capsule is short and remarkably slender, and serves, as do the smaller flowers, to distinguish this species from *H. prolificum*, which it often resembles in certain New Jersey forms in the shape and breadth of the leaves, which are sometimes almost as broad as those of that species, and which have sometimes caused it to be considered a variety of it.

H. densiflorum is found from the Pine-barrens of New Jersey to Florida, Kentucky, Arkansas and Texas. It was received at the Arboretum last year from Kelsey Brothers, now of Linville, North Carolina, and flowered sparingly in August of the same year and profusely during the present season. It promises to be perfectly hardy and to become an interesting and beautiful garden-plant. C. S. S.

Some Recent Portraits.

THE October number of the *Botanical Magazine* contains a portrait of *Nepenthes Curtissii* (t. 7138), a tall-growing, stout, Bornean species of comparatively recent introduction. The pitchers, which are the only ornament in these plants, are described as eight to ten inches long by two wide, nearly cylindrical, but narrowed toward the base, yellow-green in color and mottled and marbled with red-brown. The fringe which surrounds the orifice is half an inch broad, brown, and faintly striated with a denticulate margin.

There is a good figure of *Vanda Amesiana* (t. 7139), already noticed more than once in this journal. The native country of this handsome plant, Cambodia, is now first made known. The delicious fragrance of the flowers, their chief charm, is hardly sufficiently emphasized; and the editor has overlooked the fact that the species was named in honor of an American Orchid-lover whose collection of these plants is not surpassed by any other.

There are figures of *Iris Danfordiae* (t. 7140), a pretty yellow-flowering species of the Cilician Taurus, and of *Clerodendron paniculatum* (t. 7141), a widely distributed shrub in eastern Asia, "and a great ornament whether in the jungle or in gardens"; and of a showy East India Orchid, *Saccolabium bellinum* (t. 7142).

In the *Gardeners' Chronicle* of October 4th there is a figure of *Lilium Henryii*, the new Chinese Lily, which resembles the Tiger Lily in the shape and size of the flowers. It has, however, broad leaves like those of the Japanese *L. auratum*, and does not produce bulblets in their axils like the Tiger Lily. The perianth-segments are less imbricated than those of that species, and are bright yellow, with a few minute reddish brown dots and a few large basal papillæ. This is one of the many interesting plants discovered by Dr. Henry in western China. *L. Henryii* flowered at Kew during the past summer, bulbs having been sent by the Superintendent of the Hong-Kong Botanic Garden.

The colored plate in *The Garden* (London) of October 4th is devoted to *Gardenia Stanleyana*, a beautiful plant from west tropical Africa rarely seen in gardens, although it was introduced early in the century through the efforts of the Earl of Derby, who sent a collector to explore upper Guinea botanically. It is difficult to understand why such a desirable plant should ever have been allowed to disappear from gardens, for certainly few stove plants produce more beautiful or more fragrant flowers. These are nine inches long, with a long

slender tube and five-parted limb fully three inches across when the flower is fully expanded. The exterior of the tube is deep, rich, vinous purple, while the upper or inner surface of the limb is pure white, covered more or less completely with oblong dots arranged closely in lines, the interior of the corolla-tube being of the same color as the exterior. The texture of the flowers is thick and fleshy, and they emit a powerful fragrance. Three other species of west African Gardenias have been cultivated at different times, and all are desirable stove plants. Being natives of one of the hottest and moistest regions of the world, they only thrive in the stove, where they require rich soil and abundant water and sunlight.

Judged by the beautifully colored plate published in the issue of the *Revue Horticole* which appeared on the 1st of October, an east Asia herbaceous vine, discovered by the Abbé David and described by Carrière as *Vitis rutilans*, must be an exceedingly attractive plant. Its principal beauty is due to the brilliant bright red subspinescent hairs which beset the stems and appear also on the buds, tendrils and on the principal veins of the young leaves, which are covered on the lower surface with rose colored pubescence. The mature leaves are deeply cordate at the base, scarcely lobed and provided with stout spinulose teeth; they are large and thick, lustrous on the upper and glaucous on the lower surface. The male flowers, which are the only ones described, the female plant not being in cultivation, are produced in large clusters and are bright red and nearly scentless. *Vitis rutilans* is one of the earliest of all the vines grown about Paris to begin its growth in the spring, and the young shoots are developed before any of the wine Grapes show any indication of starting into growth. According to Monsieur Carrière, "*Vitis rutilans*, to speak generally, has, as an ornamental plant, two distinct phases, one vernal, due to the brilliant coloring of its parts, the other to its large rich foliage, which it produces until the appearance of frost, and which makes it one of the most ornamental plants yet known, especially for covering arbors or ruins, or for hiding walls and other unsightly objects."

Foreign Correspondence.

London Letter.

AN exhibition of fruit grown in the British Isles was held on the first three days of this week in the Guildhall, London. The place was as novel as the exhibition was imposing; probably in no exhibition hall or tent in England or elsewhere has there been so extensive and meritorious a collection of apples and pears. There were 4,500 dishes of fruit, and they occupied 7,000 square feet of tabling. Notwithstanding the reported failure of fruit crops this year the exhibits were generally excellent. Dr. Hogg, the venerable master in fruit knowledge, declared that "in no fruiterer's shop in London, where the best obtainable specimens are procured from various parts of the world, could such apples be found as those represented in hundreds of dishes at this exhibition."

With a view to promote the general cultivation of hardy fruit the Company of Fruiterers of the City of London decided to offer prizes for collections of fruit to be exhibited at the Guildhall, and nearly a thousand pounds were set apart by the Company to cover expenses. No charge for admission was made; on the contrary, tickets of invitation were distributed freely. The result was that about 50,000 people visited the exhibition.

Exhibitors were classified in such a way as to make the competition as fair as possible. As growers in some portions of England are much less favored by nature than are others, the country was divided into three zones—namely, northern, south-western and south-eastern. There were also sections for cottagers and for small tenant farmers, while nurserymen were separated from amateurs and gardeners. Another special section consisted of growers within a radius of seven miles from the Mansion House.

Amongst the best of the apples exhibited were Gravenstein, represented by many dishes of large, well colored fruit; Ribston Pippin, good average fruit, much better than the unfavorable summer could have been expected to produce; Warner's King, Stirling Castle and Peasgood's Nonsuch. Of the last named there were many magnificent examples, and a dish of them shown by Mr. S. Barlow, of Manchester, famous as an Auricula-grower, was declared the finest dish of apples in the exhibition. There were five fruits in this dish, and they weighed nine pounds two ounces.

Pears were not of such uniform excellence as apples, although there were no really poor samples. The best of them included such proved sorts as Marie Louise, Beurré Superfin,

† *Hypericum densiflorum*, Pursh, "Fl. Am. Sept.," 376.—De Candolle, "Prodr.," i., 547.—Coulter, *Bot. Gazette*, xi., 84.—Watson & Coulter, "Gray's Man. N. States," ed. 7, 93.

H. galioides, Pursh, l. c., 376, not Lamarck.

H. prolificum, var. *densiflorum*, "Gray's Man. N. States," ed. 5, 84.

Louise Bonne, Beurré Diel, Pitmaston Duchesse, Doyenné du Comice, Glou Morceau, Fondante d'Automne, etc.

With the Fruiterers' Company, the British Fruit Growers' Association and the Royal Horticultural Society earnestly at work as they are, the capabilities of England as a fruit-producing country ought to be fully tested.

MANURE FOR ORCHIDS.—I once asked a famous Orchid-grower his opinion of the wisdom of those growers who rec-

Glasnevin, has gone much further than this, and has used it for many epiphytal kinds with almost invariably good effect. In a paper which he prepared for the Scottish Horticultural Association, Mr. Moore relates his experience in testing Orchids with a chemical manure known as Fish Potash. This he used for various species of *Cypripedium*, *Dendrobium*, *Cœlogyne*, *Lycaste*, *Maxillaria* and *Sobralia*, all of which were so much benefited that he determined to make further experi-



Fig. 66.—*Hypericum prolificum*.—See page 524.

ommended the use of strong soils and manures for various Orchids. His reply was: "They may or may not be right; but of one thing I am certain, every Orchid without exception may be grown in peat or sphagnum, or the two combined." Professor Reichenbach was opposed to the use of manure in any form for Orchids, and I will remember his warning when he saw cow-manure water being used in our Orchid-houses for damping down in the evening. But it was long ago proved that for such Orchids as *Pleiones*, *Phajus*, *Calanthes* and similar terrestrial Orchids, manure is beneficial. Mr. Moore, of

ments—fish-potash guano becoming "a regular article on the Orchid-bench at Glasnevin." He found that *Anguloa Clowestii* and *Houlletia Brocklehurstiana* showed most marked improvement in growth when fed with this manure. The *Houlletia*, he says, "has always been more or less a puzzle to Orchid-growers. Some grow it cool, some warm, and but few really succeed with it—that is to say, succeed in growing and keeping for any considerable period nice, healthy, flowering specimens, and I confess I had not been one of these; in fact, I despaired of getting it to grow in a satisfactory manner. But

a change came over it as soon as I commenced to manure it, and I have no difficulty in growing and flowering *Houlletias* now." All *Cypripediums* made better growth when fed with this manure than when grown in ordinary soil. After three years' careful experiments Mr. Moore concluded that "the continuous use of fish manure is beneficial to Orchids; the benefit is not equally apparent each year; and lastly, the beneficial effects are most marked during the second and third

it. These remained healthy, but they did not grow as freely—that is, the new growths were not so large as the older growths, and the number of breaks were not so numerous; in fact, they evidently missed the manure." The growth made under the influence of manure was sound and healthy, and the production of flowers excellent. Mr. Moore recommends the following precautions in using this manure for Orchids—namely: Give it in small quantities, and only once a year; mix it well



Fig. 67.—*Hypericum densiflorum*.—See page 524.

years. At the third year the plant seemed to attain the maximum size of leaf and pseudo-bulb, and during the fourth and fifth years all I could do was to maintain the standard of excellence arrived at during the third year, but there was little difficulty in doing this when a little manure was used and ordinary precautions observed. I made certain that the annual addition of manure was necessary by withholding it from about half a dozen plants which had been previously supplied with

with the soil, or, in the case of plants not to be repotted, raise the sphagnum and scatter the guano over the soil.

I have referred to this subject and quoted Mr. Moore at some length, because I know him to be a first-rate Orchid-grower and a keen and accurate observer. The collection of Orchids, mainly formed by him within the last twelve years, is one of the most comprehensive and best managed in the British Islands.

HARDY AUTUMN FLOWERS.—Amongst the best of these in bloom now—in the second week of October—are the following: Belladonna 'Lily—a border filled with this plant, under the lee of a warm-house wall facing south, is covered with the tall spikes of flowers of this beautiful Cape bulb. The color varies from white, tinged with rose, to a rich rose-red; the trumpets are numerous and durable as well as beautiful; one does not hesitate to declare that this plant has no equal among hardy autumn-flowering bulbs. The Belladonna Lily requires a warm wall and it must not be disturbed when once planted, unless the bulbs become crowded.

In the same border with the Belladonnas is a large group of the rich colored Cape Irid, *Schizostylis coccinea*, with lily-shaped flowers. From the middle of September until the middle of November they will be beautiful, unless there is a very sharp frost; they are not affected by a degree or two, merely close their cups until the sun comes to warm them into expanding again. An edging of the autumn Daffodil, *Sternbergia lutea*, one of the brightest of yellow flowers, is beautiful in itself, and harmonizes with the rich crimson of the *Schizostylis*. A bed of the new *Anomatheca grandiflora* is an attraction of more than ordinary interest. Evidently, this plant will prove as useful for autumn effect as the *Schizostylis*, for its large rich crimson and maroon flowers come at the same time and are almost as effective.

Kew.

W. Watson.

Cultural Department.

Tuberous Begonias.

IN the absence of frost hybrid tuberous Begonias still make a brave show out-of-doors, though they have about ceased to grow and few new flowers are expanding. The exact value of these plants for bedding in this latitude is yet to be determined. Last summer with much wet weather and inclination to coolness beds of Begonias were very attractive and successful with little care. This season they do not appear to have done so well unless carefully watched and tended. My plants, at least, seemed to halt in their growth, were not nearly so floriferous and were attacked by black rust. The claim often made that tuberous Begonias are the coming bedding plants is hardly likely to prove true. In the first place they require, from the nature of their growth, more care than most people, not professional, are willing to give bedding plants, and they need selected situations with a certain amount of natural shading. Even when carefully hardened they are often burned by a fierce summer sun, and in some conditions of climate are quickly attacked by rust. But with a careful selection of varieties of dwarf growth and stiff peduncles, beautiful bedding effects may be made with these plants, and they are well worth the necessary care.

Probably no flowers suffer less from continued drenchings and no blooms are more showy. An unpleasing color is seldom or never seen among them. The improvement of the hybrid Begonias has not yet ceased. Growers are now giving their attention to strains of dwarf growth, and, with rigid peduncles, carrying flowers well above the foliage. As greenhouse flowers tuberous Begonias leave little to be desired, brightening up the house from early July to late in the year; in fact, some of the Socotrana hybrids carry the season through the winter. In the greenhouse they require all possible air and judicious shading. Hitherto we have had no fragrant tuberous Begonias, but a species has been collected in South America whose flowers have a distinct and agreeable fragrance. This Begonia, known as *B. Baumanni*, will probably enable hybridizers to give us a race of hybrids in which perfume will give a perfect charm to the admirable blooms.

Besides the hybrids with great showy blooms, some of the smaller blooming species are now specially attractive. *B. geranioides*, from a low cluster of round leaves, throws up numerous racemes of dainty flowers, whose pure white is accented by a dot of golden stamens. The plant has a curious resemblance to a Pelargonium, and is from Natal, as is also *B. Natalensis*, which has been before noted in these columns as a very pleasing and distinct variety with small dark orange flowers and metallic green foliage. *B. Martiana grandiflora*, *racemiflora* and *diversifolia* are three varieties of *B. gracilis* which can be recommended to all lovers of dainty beauty in plants. From the tubers are thrown numerous gradually lengthening stems, on which expand a succession of pink flowers, producing an effect as unique as it is pleasing. *B. Martiana* is an old introduction from our south-west border or northern Mexico, I believe, but is even yet apparently not well distributed.

Elizabeth, N. J.

J. N. G.

The Newer Gladioli.

LAST year much was said in the papers about a strain of Gladioli which had been produced in California, but I am sorry to say that these sorts, of which I had formed such high expectations, are not what we consider very good flowers in the vicinity of Boston. None of them withstand the sun better than our ordinary kinds; none of them have flowers above the ordinary size; none of the flowers have colors or shadings which would cause particular notice. Shasta is the best one, and is of that type of which there are so many—white, marked with rose.

The new strain raised by Lemoine, of Nancy, France, is a noble addition to our resources. He calls them the Nanceianus strain, and says they are raised from the ordinary Gandavensis sorts, fertilized with *G. Saundersi*, and their appearance confirms it, for they have much of the peculiar shape and marking of that species. I tried the same cross some years ago and got insignificant and inferior flowers, which shows that some hybridizers are more expert than others. These flowers are very large, surpassing, in fact, the promised size of the California strain. The largest is President Carnot, some of whose flowers I found to have a breadth of six inches. None of them can be said to be very good in color, but not only that, but the size of spike will be greatly improved now that the break has once been made.

I wish also to advocate the claims of some of the hardy Gladioli. Last fall I planted several hundred of these, which I covered with leaves and corn-stalks. As far as I could judge every one came up and bloomed to my complete satisfaction, beginning about June 15th and continuing to come forward in the several sorts up to the end of July. The earliest was *G. Segetum*, a species attaining a height of two feet, and producing rosy purple flowers of good size, adorned with white central stripes on the lower petals. Next came *G. communis*, with colors like the last, but with flowers of different shape and of longer duration. Then *G. Colvillei*, and *G. Colvillei albus*, or Bride, the first purple and straw, the other a beautiful white, opening with a creamy tint in the centre, which soon bleaches as white as snow. Many varieties of *G. ramosus* (a hybrid, as is also *G. Colvillei*) were conspicuous, their colors being the most vivid scarlet, crimson and rose, generally with white markings. My favorites, however, among the hardy kinds are what are called Nanus varieties, which have been produced by Dutch bulb growers by crossing many dwarf species. These only attain a height of ten or twelve inches, but their flowers are most delicate and exquisitely soft and tender in tint. They deserve to be largely grown for bouquets, for which their size and lovely colors so well adapt them.—W. E. Endicott, in *Popular Gardening*.

Cypripedium Morgania.

AS far as raising artificial hybrids among Lady-slipper Orchids is concerned, the culminating point of the hybridist's art may for the present be looked upon as embodied in *Cypripedium Morgania*. This magnificent addition to the floral world appeared ten years ago in Messrs. Veitch's nursery, Chelsea, through the agency of their foreman, Mr. Seden, who in his time has contributed many other beautiful hybrids to our Orchid-houses. The plant was raised by fertilizing the stigma of *C. superbians* (otherwise known as *C. Veitchianum*) with the pollen of the distinct and robust-growing *C. Stonei*, and was named in compliment to the late Mrs. Morgan, of New York, who took much interest in the great Orchid family. The parents of *C. Morgania* are by no means of a delicate constitution, but their offspring may be said to be as vigorous as both of them put together, if I may be pardoned for using a phrase tainted with Hibernian proclivities. Indeed, *C. Morgania* may be considered as one of the very strongest growing Cypripediums in cultivation, and this fact, in connection with its large and handsome flowers—which (with the exception of *C. Stonei platytanum* perhaps) are the largest in the genus—has led to its extensive propagation, so that one frequently sees it. Perhaps the finest specimen of Mrs. Morgan's Cypripedium is at present in the equally fine collection of Baron Schröder, near Staines. At a meeting of the Royal Horticultural Society in August last spikes were exhibited from this plant bearing as many as four and five large flowers, a number hitherto unsurpassed in its history as far as I am aware. The broad, strap-shaped leaves are a foot or more long, bright green, with darker green transverse narrow bars. The large upper sepal is creamy white, flushed with delicate rose at the sides, and longitudinally traversed by seven or eight broad, deep purple lines. The lower sepal is somewhat

smaller and with fewer purple lines. The broad, drooping petals are between four and five inches long and are fringed with grizzly blackish hairs on the margins, while the surface, which is olive-green just at the base, passing into pale yellowish white, is densely covered with large irregularly shaped blotches, these being purplish pink on the anterior portion and dark purple at the base, the difference in their color being due no doubt to the variation in the ground color. The pouch is very large and pointed, and may be described as purplish pink at the end and gradually softening into rosy brown under the edge of the mouth. The inflexed basal lobes are creamy white, spotted with purple, and the large shield-like staminode is buff-yellow and pubescent.

Last year a variety known as *Superbum* appeared in the collection of Sir Trevor Lawrence, having been raised from the best varieties of *C. superbiens* and *C. Stonei* obtainable at the time of crossing. This variety is characterized by having more highly colored flowers, and slightly shorter, broader and more heavily blotched petals than the ordinary variety. It is finely figured in the last issue of *Reichenbachia*.

As mentioned before, *C. Morganæ* is a very vigorous grower, and consequently may be easily cultivated. It likes a tolerably warm and moist house, and may be potted in a compost of fibrous peat and loam in about equal proportions. Water may be freely given during growth, and more or less frequently at other times, except in very dull and cold weather, when little will suffice.

Isleworth, London.

John Weathers.

A Few Flowering Plants.

Rogiera gratissima is a useful ornament for the intermediate house, or warm greenhouse, and deserves to be more widely known and grown; for though this plant has been in cultivation for many years it has not yet become common. It might be described in a general way as being the cool-house representative of the *Ixora* type of decorative plants, the *Rogieras* also belonging to the *Rubiaceæ*, as do the *Ixoras*, though the former are found at much greater elevations than the latter.

Rogiera gratissima is a hard-wooded shrub with simple, opposite leaves of bright green, and terminal clusters of pink flowers which have some resemblance to those of a *Bouvardia*. The flowers are fragrant and last fairly well when cut, and as they are freely produced at intervals during both summer and winter, the value of this plant will readily be seen. *Rogiera gratissima* is propagated by means of cuttings, which should be made of firm growth; for instance, from short side shoots that are about half ripened. The cuttings require a rather close atmosphere until they become calloused, after which they soon produce roots, and may be potted into a light mixture consisting of two-thirds good loam to one-third peat, to which should be added a liberal supply of sand. As the plants become larger a similar mixture should be used for potting them in, but the compost should be coarse and well drained.

Another fine flowering plant is *Dalechampia Roezliana rosea*; it is seldom seen, though easily managed and decidedly ornamental. This *Dalechampia* is very useful in small plants, as its striking inflorescence shows to good advantage. It is a native of the West Indies and enjoys a warm and moist atmosphere; under such conditions its growth is rapid, the most satisfactory plants being those grown from seeds, which germinate quickly when placed in a warm house. The chief beauty of this plant is found in the bracts surrounding the flowers, these being quite large and deep pink in color, while the flowers are yellow and rather insignificant. The leaves are from five to six inches in length and have a peculiar drooping habit.

Dalechampia Roezliana rosea seeds freely, but the seeds should be gathered as soon as they are ripe, for mice have a special liking for them. As regards soil, the *Dalechampsias* are not specially fastidious, almost any light, rich compost being suitable, provided there are the necessary conditions of warmth, moisture and moderate shading; at the same time proper attention should be given to the drainage of the pots, as these plants will not grow well in sodden soil.

Posoqueria longiflora is a fine hard-wooded stove plant from Guiana, and well deserves its specific name, for the tubular white flowers are much elongated, and may be described as having the appearance of a large *Stephanotis* flower with an abnormally long tube. The leaves are somewhat ovate in shape and dark green in color; the plant grows in bush form, and ultimately becomes a small tree. It makes more progress in a warm-house, but may be grown in a temperature of fifty-five degrees, providing it is not over-watered. *Posoqueria longiflora* is propagated by cuttings, which should be of firm

young growth, and placed in a rather close atmosphere until rooted; and as this process is somewhat slow, some little care is required to prevent them from damping off. When rooted they should be potted in a compost similar to that recommended above for *Rogieras*, in which they will thrive if given reasonable care.

A pretty little member of the *Lobeliaceæ* is found in *Siphocampylos Humboldtianus*, a plant of South American origin, also known as *S. fulgens*. This plant bears bright scarlet tubular flowers about two inches in length, and has dark green leaves of small size, smooth on the upper surface, but more or less pubescent beneath. *S. Humboldtianus* is of shrubby habit, and needs to be pinched in occasionally to keep it in good shape. It is propagated also by means of cuttings, which may be rooted almost as readily as those of a *Verbena*, though not in so short a time. No special directions regarding soil for this plant are needed, as good loam is all it requires; and given a temperature of fifty-five degrees, with a little protection from full sunlight, a measure of success is assured.

Holmesburg, Pa.

W. H. Taplin.

Notes on Shrubs.

IN view of the fact that it is likely soon to be quite extensively advertised, it may be well to note that the plant which has formerly been referred to in these pages as *Symphlocos paniculatus* should properly be called *Symphlocos cratagoides*; the latter is the name accepted by botanists generally and the one most commonly used. One firm of plant-dealers already have *S. cratagoides* on their lists, and it is desirable that there should be uniformity with regard to names of plants in the catalogues of nurserymen. In this instance, for example, it would be very misleading and confusing to amateurs to find a plant described in one catalogue as *Symphlocos cratagoides* and in another as *S. paniculatus*, each probably with descriptions so various as to give an impression that they are different species, when they are in reality identical. All honest dealers will work toward a uniformity of names, and those who employ little used or disqualified names are usually more or less unreliable and are best avoided.

S. cratagoides occupies a unique place in the shrubbery on account of its bright ultramarine blue fruit, which ripens in September, and its innumerable small white flowers, which are produced in the last days of May or early in June, and have a very light and pleasing appearance, although much hidden by the foliage of the growing shoots. The rough, thick leaves have no very peculiar qualities of an ornamental character; they are usually clean and free from disfigurement by disease. This plant may attain the size of a large shrub or small tree, and is of rather loose and irregular habit of growth; indeed, as its specific name indicates, the general appearance of the plant in some respects is much like some of our smaller species of *Cratægus* or Hawthorn, although the flowers and fruit differ widely. The thin fleshy portion surrounding the seed of the fruit is rather dry and unpleasant to the taste, while the seed is strongly pungent or almost acid; but birds, especially robins, seem very fond of it. *S. cratagoides* shows considerable variability in cultivation in regard to vigor of habit, quality of foliage and coloring and maturing of fruit.

This tendency to vary is also shown in herbarium specimens from different places where the plant has been found, and it appears to have a wide distribution in northern India, in China and in Japan. Victor Jacquemont, in his celebrated Oriental travels, found the plant at an elevation of from 7,500 to 8,000 feet, and in his "Voyage dans l'Inde" (atlas, tab. 110) is given the only figure which appears to have been published. It is drawn by the eminent artist Riocreux, and represents a flowering branch and analyses of the flowers, the mature fruit being at that time apparently unknown. The description (vol. iv., p. 103) was furnished by Decaisne, who called it *Lodhra cratagoides*. The name "Lodhra" is said to have been derived from the Indian word "lodh" applied to this and another species (*S. racemosa*) from which a yellow dye is procured. Lodhra was first used by D. Don to designate a section of the genus; later it was given a generic place by Decaisne; Bentham and Hooker include it under the old generic name of *Symphlocos*.

In striking contrast to the bright blue fruit of this *Symphlocos* we have the snow-white berries of *Symphoricarpos vulgaris* and the bright scarlet color of the native Hollies or Winterberries. Of the latter, the Smooth Winterberry (*Ilex laevigata*) is the earliest to ripen fruit, and it begins to turn red about the same time that the first fruit of the *Symphlocos* changes from green to greenish white and then blue.

It has been stated in botanical descriptions that the berries of *I. laevigata* are larger and less bright than those of the

common Winterberry or Black Alder (*I. verticillata*). This certainly does not appear to be the case in cultivation; the fruit of *I. laevigata* is little if any larger, and although it is less abundant, its color is quite as bright and rich a scarlet as that of the other species, and it ripens from two to three weeks earlier. The foliage is smooth and glossy, giving the whole plant, when in full fruitage, a very showy and attractive appearance. The leaves of *I. verticillata* are rougher and more deeply serrated and are not so glossy. The fruit is more abundant, and probably the dense, short, axillary clusters, which almost encircle the branches, gave rise to the rather misleading name of "verticillate," or whorled.

Although these two species have strong resemblances, they each have distinct and constant characters by which they may be readily identified. Both form erect, compact bushes under cultivation. For general purposes in ornamental planting, *I. verticillata* is probably the most valuable, as its more abundant fruit remains in good condition for the longest time in the autumn and winter.

Arnold Arboretum.

J. G. F.

Kniphofias from Seed.—The smaller growing kinds of Kniphofia, such as *K. Macoweni*, produce seed freely and ripen it much better than those that flower later. *K. corallina*, *K. nobilis* and *K. Saundersii* are, I believe, all of garden origin, and, when obtained true, are among the best of the older and tried varieties. One European grower is said to have as many as sixty kinds in his grounds. I would advise those who have raised these plants from seed not to place much reliance on their being true to name, as these Torch Lilies, so conspicuous in the garden, are equally so to bees and other insects. Where more than one kind is grown it is impossible to get any variety true from seed, though there is the possibility that one may raise plants of more value than the parents, as I have done on more than one occasion. I have not seen a better kind than *K. corallina*; it is the most constant bloomer of all, commencing soon after midsummer, and it continues until frost. The spike is very dense and compact; in habit it is intermediate between *K. aloides* and *K. Macoweni*. These plants are indispensable in a well arranged flower border. In the eastern states none are hardy, though some may live out-of-doors through a mild winter, but it will take a season for them to recover and to flower again. It is a simple and safe plan to lift the roots and cut off the tops to within twelve inches and winter in sand in a cool cellar. They should be taken out early in spring, before they begin to grow, and planted in rich soil. These plants will repay liberal treatment.

South Lancaster, Mass.

O.

Lælia Eyerermaniana.—During the months of July, August and September plants of this attractive Lælia may be met with in various collections showing their flowers. At present it is little known, owing chiefly to the fact that there are not a great many plants in cultivation, and also because it has only been introduced about two years, having been imported in 1888 by Messrs. Sander & Co., of St. Albans, with a consignment of *Lælia majalis*. It is generally supposed to be a natural hybrid between this latter species and *L. autumnalis*, and there is every reason to believe that such is the case, inasmuch as it is impossible to distinguish the pseudo-bulbs of *L. Eyerermaniana* from those of *L. majalis*, while the flower is intermediate between the two species as far as structure and markings go, but, curiously enough, is much smaller than either *L. majalis* or *L. autumnalis*, a fact which seems difficult to explain. Last year I saw about a dozen plants in flower at one time, and there was little or no variation to be noticed in them, except in the number of blooms borne on the peduncles, some of which bore as many as ten and twelve flowers, while others had as few as three and four. The ovate-acute sepals and rhomboid-acute petals are of a clear rose-purple, the sepals being remarkable for having a greenish knob at the tips. The erect lateral lobes of the lip are white, with divergent lines of violet or purple spots on the inner surface, while the broad, obovate-apiculate front lobe is dark rose, with deeper colored veins on each side. On the disc are two elevated, violet-spotted keels, which become constricted about midway, then open out again, when a third yellow keel appears between them. The slightly curved column is pure white, except at the base, which is pale yellowish green, spotted with violet. The pseudo-bulbs are ovoid, more or less wrinkled according to age, and have two or three deep green, oblong, leathery leaves, about six inches long on the summit, both leaves and bulbs, as before mentioned, resembling those of *L. majalis*.

As years go on, and *L. Eyerermaniana* becomes more plentiful, one may expect to meet with it more frequently than at present, especially as it produces its flowers freely and re-

tains them in a fresh condition for several weeks. The plants are best suited for basket culture, and may be suspended near the roof, so as to obtain plenty of light. They will thrive in a cool house, although it is beneficial if a slight increase in the temperature be made when they first begin to push their young growths, the strength of which must act as a guide for the amount of water to be given. A cool, dry atmosphere will be found to keep the flowers in greater perfection than a warm, moist one, which soon causes the flowers to be spotted.

The specific name is given in compliment to Mr. J. Eyeraman, of Easton, Pennsylvania, who, I believe, has a splendid collection of Orchids.

Isleworth, London.

John Weathers.

Amaryllis Belladonna.—The beautiful Belladonna Lily, as it is popularly called, flowered with me this autumn for the first time. Early in the spring I purchased a few strong bulbs, which I planted in the latter part of May in rather poor sandy soil near the wall on the south side of my house, where they have all the sun-heat necessary for their development. Early in September the largest bulb pushed up a flower-stem which reached a height of about twenty-two inches. It was dark reddish brown in color, overlaid with a delicate light bloom, like that on some grapes. The flower-buds were rosy red, and the flowers at the time of opening light rose with a yellowish white throat, changing to dark rosy shades on the second day. There were eleven flowers in the umbel, and each one lasted in full beauty more than a week. This umbel of well opened flowers, glittering in sunshine as if sprinkled with ice, was a beautiful sight to look at. The perfume of the flowers was sweet and spicy. In the northern and eastern states the Belladonna Lily must be grown in pots, as it will not endure in the open air the rigors of our winter climate. It would be interesting to know if this plant succeeds in the open air anywhere in the south. I tried to grow it in Florida, where the soil is sandy, but without any marked success. Apparently, the heavy rains there in summer, when all these plants are resting, are fatal to their health.

The home of *Amaryllis Belladonna* and its varieties is in the south-western part of the Cape of Good Hope, where it grows in great abundance. *A. blanda*, which is described in the excellent "Hand-book of Amaryllideæ," by Mr. J. G. Baker, as a variety of *A. Belladonna*, appears to me to be a good species, the bulbs being larger, dark brown and egg-shaped, while those of *A. Belladonna* are brownish gray and nearly globular. The flowers of *A. Belladonna* are more open, rosy white and more fragrant. The so-called *A. Hallii*, which I have always supposed to be near *A. Belladonna*, is now referred by Mr. Sereno Watson (GARDEN AND FOREST, vol. iii., p. 176, Fig. 32) to a distinct genus, *Lycoris*. In addition to this species, *Lycoris squamigera*, I have in cultivation *L. radiata*, *L. radiata Terraciniiana* and *L. aurea*; none of these, however, have flowered yet.

Milwaukee, Wis.

H. Nehrling.

Correspondence.

Kansas Farmers and Kansas Forests.

To the Editor of GARDEN AND FOREST:

Sir.—Though Kansas possesses no timbered area that, for extent or density, will compare with the forests of the eastern or middle states, there is a considerable extent of country along the eastern border which was originally well clothed with trees—in the bottoms a heavy and valuable growth, on bluffs and uplands a scattering stand of scrubby Oaks and Hickories. Farther west the timbered area is narrowed and confined more closely to the streams, and beyond the junction of the Blue with the Kansas River the last wooded hills are seen. Beyond this point the trees on the slopes of the bluffs disappear, and only the banks of the streams and the lower benches are wooded. Before the head waters of either of our larger western rivers are reached, the last solitary Cottonwood or Elm will have been passed and the Buffalo Grass and the Blue-stem are masters of the field.

The trees are not keeping their bounds without attempting to acquire territory, and every rod of soil where the fires cannot sweep is sooner or later covered with timber. A bend of a stream nearly surrounding a bit of bottom land affords the best chance for an advance if the fires are prevented from entering from the unprotected side. Where natural conditions or the care of man afford this protection we soon find those advance guards of forest-growth, the Sumach and the Dogwood-bushes, springing up among the Blue-stem Grass. Before long from the midst of these thickets young Oaks, Walnuts and Elms shoot up, and in a score of years form a handsome

grove. Out along some narrow ravine or draw leading down from the bluffs the trees push their way, year after year, where fires have failed to reach them. Then comes a wet season, with an unusual growth of Grass, a dry day, with the wind in just the right direction, and the fire sweeps down, deadening the young growth back nearly to former limits. But the sturdy roots are left alive, and the contest is renewed till, at length, the trees overshadow and drive out the Grass, and so deprive the fire of fuel.

With the general settlement of the country came the steam saw-mill and the demand for all grades of native lumber, as well as for thousands of loads of stove-wood. Many of the owners of timbered lands, reckless of the future, sold their trees till not a valuable stick was left. The trees that stood upon the land of a non-resident or upon state or school lands were chopped and plundered by day and by night. Cases could be cited in some of the western counties where a fine growth of Red Cedars was so completely cleared from the bluffs that neither stumps nor roots now remain in the chalky declivities to give a hint of the verdure that once covered them. Kansas pioneers dealt with the scanty growth of timber they found with the same reckless disregard for the future which led to the extermination of the White Pine farther east. Those who settled first and secured timbered claims had more than enough wood for their needs; the prairie homesteader had none. It is perhaps not just or consistent to blame too severely these early pioneers who came to the state often with little besides the team and wagon which brought them. With the nearest railroad station fifty or a hundred miles away, where Pine-lumber of poor quality could be had only at enormous prices, it was natural that as much as possible of the native timber should be turned to account. But there is a waste and destruction of young timber taking place to-day against which the warning voice cannot be too earnestly raised. It may sound strange to speak of clearing timber land in Kansas, yet it is a fact that within a single county, during the past few years, many acres of thrifty young timber have been chopped and placed on the market as stove-wood or fence-posts. I have seen scores of young Black Walnut-trees, not thirty years old, split into rails and fence-posts, without a thought on the part of the owner that the supply of merchantable Walnut-lumber in the east and south is nearly exhausted, and that he was clearing the ground of trees which would be of great value to his children. A slaughter like this is often made to secure one more field for Corn or Wheat, and this by a man who has already more acres under the plow than he can bring to one-half of their productive capacity.

In spite of much chopping and a great deal of abuse, the timbered area of Kansas is probably greater than it was thirty years ago, though the number of trees that would afford profitable saw-logs is comparatively small. Where a wise foresight has been exercised we find valuable varieties which will soon do to draw upon for lumber. Oak and Walnut spring up readily where older trees of those sorts are established to furnish the seed. The Green Ash soon gains a footing on moist land and makes a rapid growth while young. Several species of Hickory spring quickly into valuable groves in the more eastern portion of the state. In fact, wherever trees have obtained a hold there is abundant encouragement for the man who will protect them and give them a chance.

When the farmers who own the timbered lands make it a rule to cut only mature trees or crowded and imperfect ones, except when needed for special use, thinning judiciously and preserving with care every young tree of a valuable variety; when timber-lands are as carefully guarded from fires as the stock-yards and stables, and when cattle are not allowed to tramp out the young seedlings for the sake of the scanty pasturage furnished by the woodland, the value and profit of Kansas forests will steadily increase.

We need not expect to see Kansas lumber quoted in the great markets of the nation, but we may see many domestic wants supplied by it in the way of fuel, fencing, and of the ever needful material for buildings and implements upon the farm, at a time when the hardwood forests of the southern states are no longer sold at the Government price per acre, and when the manufacturer's supplies of hardwood lumber will be more difficult to obtain than they are at present. The commercial value of this young timber is not its only importance. The benefits to be derived from a dense growth of trees and underbrush on the low bench-lands of our rapid streams, in checking the force and destructiveness of floods, is beyond computation. When the uplands were covered only with Buffalo Grass, which was burned off every year, and the draws and water-courses were destitute of a tree or shrub to check the force of the current when it left the channel,

the suddenness with which an unimportant branch assumed the proportions of a navigable river can only be appreciated by a man who has been on the wrong side of one of them at nightfall, or who has, perhaps, seen his team washed down the boiling current while he was glad to cling to a friendly Elm-top and wait for the flood to run down. The replacing of Buffalo Grass by coarser and ranker varieties, the more ready absorption of moisture by cultivated fields, and the holding in check of the swollen torrent by the increased growth of trees and shrubs along the banks, have all tended to reduce the suddenness and destructiveness of the floods with which the early settler was so familiar. As a further indication of change for the better there are now many streams which flow nine months in the year where there were formerly dry channels except after heavy rains.

The future of Kansas forests must rest with Kansas farmers. Give the trees protection from fire and stock, with a little timely thinning and pruning; cut them as they reach maturity, and provide the way for others to take their places, and the woodlands will grow continually more valuable and yield a return as safe and sure as the best plowed fields.

Agricultural College, Manhattan, Kan.

S. C. Mason.

Recent Publications.

The Art and Practice of Landscape-Gardening, by Henry Ernest Milner, F.L.S., Assoc. M. Inst. C. E. With Plans and Illustrations. London, 1890. Quarto.

The author of this book is an English landscape-gardener of experience, having begun his work as colleague of his father, Edward Milner, who was associated with Sir Joseph Paxton during his later years in all the works he then carried out. That Mr. Henry Milner's own tasks have been varied and important is shown by the references and illustrations in this book, which speak of large private places conceived and carried out by him on the continent as well as in England, and also of public gardens and cemeteries. The book is well written and handsomely printed; the plans are large in scale and printed in colors; and if the etched views had been as good in their way nothing but praise could be given to the externals of the volume. The text deals partly with general principles of taste as concerned with the different problems of the art and partly with the practical treatment of such problems.

The purely æsthetic chapters will, perhaps, do nothing to modify or enlarge the opinions or tastes of those already familiar with standard works on landscape-gardening, but they will give sound guidance to a beginner, and here and there we come across a passage where a familiar truth is particularly well expressed. For example, every one knows the generic difference between the formal gardening of Renaissance times and the "natural" or landscape method of treatment which developed in the eighteenth century. But this difference is freshly impressed upon the reader when he is shown that, while the later aim has been to simulate in a measure the aspect of untutored Nature—to bring, as has elsewhere been said, the country into the garden—the older ideal was to lay out the garden "for utility or for pleasure, with a purpose of distinguishing it from the surrounding scenery." Regularity and order then "contrasted with Nature's aspect outside," while to-day a carefully calculated irregularity and variety are made to harmonize with this aspect. Of course, the author's preference is in general for the modern naturalistic style, but it is agreeable to find how clearly he recognizes the claims of architectonic designing in certain places and cases. As in every other art, the mode of the day is apt, in gardening, to impose itself so strongly on the artist's mind and taste that he can see no good in any other mode, and instead of an enlightened adherent of the style he prefers, he becomes its unreasoning, and, therefore, often mistaken advocate. Thus, in this country as in England (and even on the continent, where one might anticipate a clearer recognition of the perennial claims of architectonic designing), we see constant errors in the treatment of small surfaces of ground and the arrangement of the areas close to dignified buildings. Tiny rectangular yards are laid out with a futile, trivial effort to obtain a "landscape effect," and palatial homes and public structures are made to look as though they had been casually dropped down on a bit of untouched ground, among trees, shrubs and grassy spaces where the presence of architectural factors had not been anticipated. From errors of this sort Mr. Milner's words should free the mind of any neophyte in the practice of his art. He perpetually insists upon the elemental fact that a large house should be supported, and its dignity and the beauty of its lines increased, by the arrangement of the levels and the planting

close about it—that, in short, something in the way of formal designing should make the transition between its formal lines and the graceful variety of the grounds further away. To make this transition well—to make the formal designing harmonize with the house on the one hand and with the true landscape passages on the other—is, of course, the most difficult of the artist's tasks; nor is it an easier task when buildings are not in question, but when, as in the case of a public park, certain elements of formality are still demanded for grandeur of effect or for convenience of public use. In learning how to treat such tasks much help, we think, will be afforded by the more practical portions of our author's text and by his plans. Especially interesting is his description of the transformation of an estate in Hungary, where he deflected a public road which passed too near the front of the old house, and arranged the ground on that side, as well as on the other sides, in what seems to be a very ingenious, intelligent and successful way. A special chapter of interest is given to "Terraces," and among the practical chapters, hot-houses, the kitchen garden and the economic treatment of land are dwelt upon, as well as those questions of arrangement and formation, of planting and of the treatment of water and of approaches, which one would be more sure to expect. Of course, certain counsels—as, for example, with regard to the most desirable trees and shrubs, lists of which are given for different soils and situations—will be of little use to the American as compared with the English student. But there is still much in the book to instruct the former, and we would especially call attention to the chapter headed "Water" as dealing with a subject usually less well understood than others. "The Approach" is another good chapter, illustrated with interesting plans. It is a question, however, whether, in the two large schemes for planting which are illustrated, the author's desire to secure variety has not led him to use too many species of trees. There is no scale appended to show the size of the intended boundary plantation, for example; but it would need to be very large, indeed, to admit, with good effect, of the introduction of the forty-four species whose names and places are marked thereon. Nor can there be many situations in which, for practical cultural reasons, it would be wise to mingle so large a variety of indigenous and foreign trees. On the whole, however, while the volume is in no sense a remarkable or very inspiring one, it can be recommended to the attention of serious students, especially those who are not able to read the many similar treatises which exist in the French and German languages.

Notes.

The forest-fires which have raged during the past summer in the Black Hill-region of Dakota are reported to be the most destructive which have visited that part of the country since it has been open to settlement. Sixty square miles of timber are said to have been burned over.

Discoveries made not long ago near the Stabiana Gate, in Pompeii, included the trunk of a tree which an Italian savant has identified as *Laurus nobilis*. Some of its fruits were likewise found, and from their size it is now said that the eruption which destroyed the city must have taken place in November, and not, as previously believed, in August.

According to the *Victoria Colonist*, one of the largest Douglas Firs ever cut in that vicinity was recently measured at a mill in Vancouver. It included four twenty-four-foot logs, the largest of which measured seventy-six inches in diameter, and all of which were perfectly free from knots. The whole product was estimated at 28,614 feet.

The true Apples do not, as a rule, assume any decided autumn coloring of foliage. The exception is the Japanese *Pyrus Torino*, a small hardy tree distinguished by its curiously lobed leaves, which resemble those of some species of *Cratægus*. These are now colored deep purple, and are very ornamental, and quite distinct from those of any other Apple-tree.

Mrs. Elizabeth G. Britton announces in the *Bulletin of the Torrey Botanical Club* that as there is a demand in the eastern states for a hand-book of Mosses smaller and cheaper than Lesquereux and James' Manual, and as, moreover, the edition of this is nearly exhausted, she is preparing an illustrated work to be called "A Hand-book of the Mosses of North-eastern America." The area denoted by the title will include eastern British America and the north-eastern and central states, and it is hoped that the volume will be ready for publication by the end of next year.

The autumn coloring of the foliage of the Japanese Negundo (*Negundo cissifolium*) is surpassed in beauty by that of few exotic

trees. The general color of most of the leaves at this time is bright orange. Those at the end of the branches turn first and are brilliant scarlet, the contrast between the two colors producing a beautiful and striking effect. *N. cissifolium* is a small, perfectly hardy tree of excellent habit and pleasing color through the summer. It is vigorous, grows rapidly, and so far shows none of the constitutional weaknesses which have made many other Japanese plants of the Maple tribe so unsatisfactory and disappointing in this country.

A writer in *Gartenflora*, speaking of the profusion of roof and terrace gardens which enliven the streets of Paris, mentions as one of the most remarkable the terrace-garden of Monsieur Lockroy, the father of Victor Hugo's son-in-law. Once a popular writer of comedies and operettas, Monsieur Lockroy is now above all an amateur gardener, and his "hanging garden," which lies twenty metres above the street, shows the results of thirty years' affectionate labor. Its care is entirely in his own hands, and in a multitude of pots he grows not only beautiful Roses and other flowers in profusion, but fine pears and peaches, apples and luscious grapes, which clothe a wall that rises above the terrace, and which "have never been endangered by the phylloxera." In winter sufficient protection for the plants is afforded by a temporary light shed with sliding panels, which may be opened in propitious weather.

We have received several chestnuts of named varieties from different nurserymen. One of these from the Pomona Nurseries at Parry, New Jersey, is the nut of a Japanese variety, and it is well named Giant from its remarkable size. Mr. Samuel C. Moon sends a sample of the variety Numbo, and Mr. William H. Moon also sends some fine specimens. These nuts vary in quality, but none of them equal in sweetness the nuts on our native trees. The Japanese nut is surrounded by an especially bitter and puckery skin, which can, however, be easily removed. All these big nuts are greatly improved in flavor by being boiled or roasted, and when thus prepared they are almost as good in quality as the American chestnut. There is little doubt that a grove of any of these large varieties would prove a remunerative investment in places where the trees are hardy. It is high time for some of our experiment stations to begin the work of crossing the foreign kinds upon our native stock for the purpose of securing a race of hardy trees which will produce nuts at once of large size and the best quality. Practically nothing has ever been done in the way of developing our native nuts by selection, and no one knows how much improvement is possible until the same care in crossing and selecting is used to produce an ideal Chestnut as has been exercised for generations in perfecting the Apple or the Pear. The nurserymen, who are giving an impulse to nut-culture by calling attention to the possibilities in this direction, are doing the country good service.

The annual report of the superintendent of the Royal Botanic Garden at Trinidad has reached us, and, like its predecessors, contains a large amount of useful information about various tropical economic plants and several interesting and instructive illustrations, the most striking being that of a noble specimen of *Corypha elata*, surmounted by an enormous panicle of fruit estimated to weigh over a ton. Mr. Hart calls attention to the fact that the large crown of leaves borne by this Palm withered and fell flat to the stem soon after the appearance of the huge panicle of flowers. As the fruit set and commenced to develop the leaves became dry, then hung down (as shown in the illustration) and finally fell off, leaving nothing but the crowning panicle of fruit. Mr. Hart remarks: "From the early falling and drying away of the leaves after the period of anthesis, it is fully evident that they cannot assist in any way during the period in supplying or manufacturing the plant-food necessary for the formation and development of the seeds, and that the supplies and material for such purpose must have been accumulated and deposited in an easily assimilated form in the stem itself. This will form an important fact for those who are discussing the movement of fluids in the cells of plants." He points out that morphosis of this character, although rare in temperate climates, is a familiar feature in tropical vegetation. The Silk Cotton-tree, *Eriodendron anfractuosum*, of which a portrait appeared in GARDEN AND FOREST (iii., p. 341), is cited as an illustration of this phenomenon. This tree produces its flowers and sets its fruit at a period of the year when it is entirely destitute of leaves, the seeds being distributed by means of the cotton attached to them just as the tree is putting out the new set of leaves for the season. Mr. Hart, as he has in previous reports, deplors the want of interest taken in forest-preservation on the island, and the inevitable destruction, under the existing feeling on the subject, of the valuable forests which still occur in some parts of Trinidad.

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The Catalpa.

THE genus *Catalpa* is eastern American and eastern Asiatic in the distribution of its species. Two of these occur in North America, one in the West Indies, one in Japan and one in the northern regions of China. They are all trees with ample, generally opposite, simple leaves, large terminal panicles of showy flowers, and long, slender, nearly cylindrical capsular pods. The flowers, which appear in all the extra-tropical species in early summer, are characterized by the deeply two-lipped calyx, the irregularly two-lipped, bell-shaped corolla, which is white and conspicuously marked with purple and yellow in the throat, and by two, or rarely four, fertile, and one to three sterile, rudimentary stamens. The capsule is divided into two cells by a partition which is at right angles to its valves. The seeds are numerous and densely packed in the cells of the pod; they are furnished on each end with long, papery wings, cut at the extremity into delicate white fringe.

The familiar species, and the type of the genus as it is now constituted, is *Catalpa bignonioides*, the Catalpa-tree or Indian Bean. It is a low, wide-branched tree, with a short, stout trunk covered with thin, pale, furrowed bark. The wood, like that of the other species, is light brown, and contains numerous large open ducts, which mark the layers of growth. The wood of all the species is remarkable for the thin sap-wood, which consists of three or four layers of annual growth only. The leaves, which emit a disagreeable odor when crushed, are cordate at the base, somewhat acuminate, and are occasionally provided with a pair of salient lateral teeth. They are light yellow-green in color, and do not unfold until nearly all other trees are covered with foliage. The flowers open at the north late in June or during the early days of July; they are produced in very large, compact panicles, and are about an inch or an inch and a half long. They are peculiar in their campanulate corolla, with an oblique limb and entire lower lobe. The inner surface is thickly covered with purple spots and is streaked with yellow.

This tree has much to recommend it as an ornament for the garden. It is hardy; it grows rapidly; it is not very

particular about soil, and insects do not prey upon its foliage. The large, brilliant leaves have an almost tropical appearance, and the flowers, which appear late in the season, when flowers are particularly valuable, are produced in the greatest profusion. There are few trees, certainly, of temperate regions which present a more remarkable floral display than a large *Catalpa*-tree in full bloom. These qualities have made the *Catalpa* one of the most popular trees in all the temperate regions of the world; indeed, it has been cultivated so long, and has now become so completely established in many parts of the southern states, that it is not easy to determine exactly where it grew before man carried the seeds from one part of the country to another.

The *Catalpa* appears to have been first made known to Europeans by Mr. Mark Catesby, the English naturalist, who was in our south Atlantic regions early in the last century and who is remembered by his handsome "Natural History of Carolina," which appeared in London in 1731. He published an excellent figure of the tree, which he says was unknown to the inhabitants of the settled portions of Carolina until he introduced it from the remoter parts of the country. What Catesby meant by the remoter parts of the country is not clear; but it is hardly probable that he ever penetrated more than one or two hundred miles from the coast, and certainly he never crossed the mountains into the region which is now generally regarded to have been the first home of this tree—south-western Georgia, and central Alabama and Mississippi. It is probable, therefore, that the *Catalpa* was first brought east of the Alleghany Mountains by the Cherokees, who are known to have been somewhat interested in plants, and that it was from their cultivated trees or their offspring escaped to the forest that Catesby obtained the plants for the Carolina planters and for his English correspondents, to whom he sent the *Catalpa* as early as 1726. Even to this day there is doubt in regard to the true home of the species. It may be seen growing on the banks of the upper Apalachicola and Flint Rivers in south-western Georgia, so remote from existing habitations that it is difficult to imagine that the seed which has produced these trees could ever have been blown from cultivated plants. Still, it is impossible to surmise how far a plant provided with seed so admirably adapted for transportation by the agency of the wind can eventually be carried from an original starting point; and the fact that the *Catalpa* is hardy so far north, and that it has even become naturalized in some parts of Pennsylvania, seems to be an indication that its true home is not in the hot, low, semi-tropical country of the Gulf states, but rather in some still unexplored mountain region of the Appalachian foot-hills, from which it was early carried by the Indians east into Carolina and south-west into Georgia and Alabama, through which states and beyond it has gradually spread until it is now found over a large area of the middle and southern states.

Two well marked varieties, at least, of this tree have appeared. The first, the so-called Golden *Catalpa*, has bright yellow foliage. The second is a dwarf, compact shrub rarely attaining a height of six feet, but spreading widely, and thickly covered with leaves. This curious plant, which is not known to have produced flowers, passes universally in nurseries as *Catalpa Bungei*, although it has nothing to do with the Chinese species of that name. It is sometimes grafted as a standard on tall stems of the *Catalpa*, and, grown in this fashion, it makes a small tree with a compact round head, useful for the decoration of small gardens and city squares.

The second North American *Catalpa*, *C. speciosa*, was distinguished specifically a few years ago by the late Dr. J. A. Warder, a Nestor among American tree-planters in the west. It is a native of the river-swamps which abound about the mouth of the Ohio and the adjacent parts of Missouri. Dr. Warder's attention was directed to some *Catalpa*-trees planted in the streets of an Ohio town, and found that they grew more rapidly than other individuals planted

with them, and that they assumed a more upright manner of growth. He found, too, that the ends of the branches of these trees were not killed in winter, as was the case with many Catalpa-trees, and that they flowered fully two weeks earlier; that the flowers were considerably larger, and were produced in shorter, fewer-flowered panicles; and that the pods were much larger and nearly twice as thick. These observations led him and several botanists to study these peculiar trees, and it was found that the western Catalpas all differed in these respects from the trees which had been ordinarily cultivated in the eastern and southern states, and that instead of one, North America could boast of two species. It was found, and this is probably true of all the species of the genus, that the wood of *C. speciosa*, although not hard or very heavy, possessed the power of resisting decay in a remarkable manner when placed in contact with the soil. It was found, too, that the young trees grew with astonishing rapidity, and were hardy as far north certainly as the forty-second degree of latitude, and could support the climate and high winds of the western prairies. These were qualities which western planters were in search of, and nurserymen at once set about raising the western Catalpa in great quantities. It has so far proved to be all that was expected of it, and millions of these plants have already been planted in the United States, especially in the west.

The other American species, *C. longisiliqua*, is a large forest-tree widely distributed through the West Indies, where it is prized for its hard, handsome wood, used in cabinet-making, and known as Spanish oak.

The Japanese Catalpa, *C. Kämpferi*, is a smaller and less beautiful tree than either of its North American relatives. It has darker green foliage, smaller and less showily-colored flowers and slender pods. It is no longer a rare plant in American gardens, where it grows rapidly, flowers and fruits profusely, and is perfectly hardy as far north certainly as eastern Massachusetts. An interesting hybrid between this and one of the American species, described in this journal last year (ii., 303), has appeared. It is remarkable in characters intermediate between its two parents, in its hardness, and in its vigorous and rapid growth.

The second Asiatic species, *C. Bungei*, which must not be confounded with the plant found in nurseries under that name, is a native of northern and central China. It is a large tree, with smaller flowers and leaves than those of the American species, and is not yet known in cultivation either in the United States or in Europe. It may be expected to thrive where the Ailanthus will grow; and its introduction into our plantations has long been desired by American dendrologists, who have sought in vain to secure a supply of seeds of this interesting tree.

The illustrations in the present issue display the appearance of *Catalpa bignonioides* as a cultivated plant, and show the unusual method adopted by an old specimen to extend itself by means of rooting branches. Our readers are referred to the account of these venerable trees printed on page 536. It is from the pen of the great-grandson of the man who planted them, and whose descendants down to the fourth generation have been able to watch their growth—an unusual and noteworthy occurrence in this country, where homes are rarely handed down beyond the second generation, and where the children of more than two generations rarely play beneath the shadow of the same trees.

A correspondent of *The New York Journal of Commerce* writes from the White Mountains that he was recently surprised by sounds like distant thunder, which rose at intervals above the steady roar of the October wind in the woods. He was led to make inquiry as to these repeated mutterings and this is what he learned:

Some miles down the valley is one of those glorious mountain torrents which are, or ought to be, the pride of New Hampshire. It comes out of a gorge in the hills, leaping from the shadows of the old forests into the open light of the valley,

with more of spirit and freshness than perhaps any other of all the New Hampshire mountain streams. I am told that the sounds I have heard are the explosions of dynamite and giant powder, wherewith men are blasting out the rocks in this wild river, reducing its freedom to canal-like regularity, so that hereafter the forest-trees which are the glory of Mooseilauke can be cut and sent down stream to market. We have no right to quarrel with the men who are doing this. They own the forests and they own the river, and no one expects them to make a donation of their lumber and their river to the public. But it is now of most pressing importance that the State of New Hampshire should exercise its right of eminent domain and purchase these forests and streams and preserve them. The work of destruction is going on all around the mountains. Timber railroads have been pushed up to and into the ravines on the south and north sides, and now the streams, which, when the destroying work is complete, will cease to flow, are to be compelled by the forces of dynamite to become their own destroyers.

No, we cannot, under ordinary circumstances, complain when a man cuts the timber from his own land, even when he cuts it wastefully. But the forests of the White Mountains have a value beyond the market price of all the lumber they contain, and the wild White Mountain streams have a value beyond their capabilities of floating that lumber to market after they have been subdued to the logger's use. Apart from the function of these mountain forests in regulating the flow of the streams which take rise among them, their highest productive value lies in the charm they lend to the scenery. Even from a material point of view the loss to the state of New Hampshire which the defacement of this scenery would cause, by robbing the region of its attractiveness to tourists, would be incalculable. The native beauty and sublimity of the White Mountains are a source of revenue which will increase indefinitely with an increasing tide of visitors, and it is a short-sighted business policy, not to speak of other considerations, which permits so productive an inheritance to be squandered.

Ornamental Fruits in the Pines.

FOUR species of *Ilex* are now showing their ornamental fruits in the Pines. The Holly (*Ilex opaca*), with its fine foliage, sharp and spiny, and its scarlet berries, is handsome all winter. So is the Inkberry (*I. glabra*), with black fruit and shining smooth leaves. Both are abundant, the latter in all damp places. And the Black Alder or Winter-berry (*I. verticillata*) is everywhere in the swamps and bogs, and still holds its foliage, while the twigs are encircled with masses of bright red berries. Later the leaves will fall, but the berries will remain all winter. The Smooth Winterberry (*I. laevigata*) is also here, but not so abundant as the other species. The fruit ripens earlier and is larger than that of the Black Alder, and is now very bright and showy.

The clustered red fruit of the Flowering Dogwood (*Cornus florida*) is more beautiful than the flowers, and almost as showy. Another species of *Cornus* (*C. sericea*) which grows in wet places has pale blue fruit in flat cymes. This also is quite ornamental. And *Viburnum pubescens* is here, too, with flat cymes of dark purple fruit.

A cluster of the fruit of the Sassafras is very pretty. A fleshy red stem supports the blue berry, making it quite unique. The berry has a sharp, pungent taste, more concentrated than the bark of the root.

The cone-like fruit of *Magnolia glauca* is handsome in all of its stages. At first it is green, and as it matures it takes on yellow and rosy pink hues, and when fully matured the carpels split open and reveal the beautiful coral red, berry-like seeds, which soon drop out of their places, and are held in check by spiral threads which unroll and hold the dangling seeds suspended all around the cone.

Thick tangles of *Smilax* impede our progress. These thickets are terrible, almost impossible to penetrate to any distance—a tangled confusion of vines climbing over shrubs and trees, armed with sharp, stout prickles. But the vines hold pretty clusters of fruit, and one species has coral red berries, but most bear black fruit, some with a bloom like that of the grape, others with shining black berries. A difficult genus it seems to me, all mixed up and as hard to identify as it is difficult to penetrate the thicket.

Above these thickets, growing on old Sweet-Gum-trees, are clumps of Mistletoe, with clusters of pearly white berries.

And the Sweet-Gum has attractive fruit, also—spherical heads suspended by long pedicels on naked twigs, mostly persistent, swaying in the wind throughout the winter. And here is the Ampelopsis, a flame of color, clinging to the rugged trunks of the Gum-trees, and holding clusters of bluish black fruit in reserve for winter feasts for the bluebirds and robins, whose winter quarters are in the great Cedar-swamps of the region.

And the Cedars are now adorned with pretty, berry-like fruit, covered with a glaucous bloom of pale blue. The covering of the seeds is sweet and nice to the taste, and is highly relished by many birds, especially by bluebirds and robins.

The Climbing Bitter-sweet (*Celastrus scandens*) is now displaying its scarlet seeds here and there in the Pines. I found one clinging over an old Cedar-tree which made a charming picture and gave me a hint to go and do likewise in my garden, a result easily accomplished, as both the Cedar and the Bitter-sweet were already there. Not far from this Bitter-sweet the Virgin's Bower (*Clematis Virginiana*) had formed a pretty bower by climbing over some bushes, and, not content with these, it had reached up to a tree, where it displayed its feathery white tails in conspicuous clusters. At a little distance these feathery appendages of the seeds looked like a mass of white flowers.

The Sumach (*Rhus copallina*) is now quite ornamental both in foliage and fruit. The fruit is a dense crimson colored panicle, extremely acid to the taste. And the terrible poison Sumach (*R. venenata*) looks handsome with its scarlet foliage and drooping panicles of white fruit, which I can only admire at a safe distance.

We find plants of the Wax Myrtle (*Myrica cerifera*), with branches almost covered with the white waxy seeds. The foliage and fruit are both fragrant, making it a desirable addition to our ornamental collection. And the Wild Rose hips are abundant and almost as pretty as the flowers. And there are many dry fruits, especially in the Heath family, whose seed-pods are ornamental, such as Andromeda, Leucothoe, Azalea and others.

Turning our attention to the ground, we find in places that it is almost covered with the aromatic Wintergreen, with clusters of sweet, spicy, red berries. And the Partridge-vine (*Mitchella repens*) is creeping around old decaying stumps, showing its twin scarlet berries. And the Wild Cranberry is trailing about in the moss with crimson fruit sour enough to set one's teeth on edge; but the long sprays, covered with small evergreen leaves, and the bright berries, are very ornamental.

Vineland, N. J.

Mary Treat.

Cranberry Culture in New Jersey.

IT often happens that the same crop is profitably grown in different places under different systems of cultivation, and many Cranberry-growers in New Jersey claim that Cape Cod methods are not the best—for New Jersey. I have spent part of two seasons on bogs of the Cape, and have spent a good deal of time for several years past on New Jersey bogs, primarily studying the insect enemies of the Cranberry, but with an eye also to methods of culture. Cape Cod methods are well described by Professor Bailey in the paper quoted in GARDEN AND FOREST (page 511), and perhaps a few words on New Jersey methods, inasmuch as they differ, may prove of interest. The bogs to be cultivated do not differ very essentially from those of the Cape-Cod region. A peat bottom is preferred, and the land once located, dams enough are built to flow it, and the water is left on for a year to kill off the bulk of the vegetation. This is then cut, the brush is uprooted and carried off and the ground decently cleared. The Cape Cod grower would thoroughly remove all stumps, level his bog carefully and sand heavily. This practice has been quite generally followed in New Jersey until a few years ago when some large growers claimed that sanding was unnecessary, and the vines are now generally planted in the mud. Where the vegetation has been killed by flooding, holes are punched in the decaying mass, and vines are set as described by Professor Bailey. It has been noticed that the heaviest crop of berries is borne by vines surrounding stumps, and these are now left in the ground to decay naturally. Ditching and draining are done as on Cape Cod, and old mill-ponds have become favorite sites for bogs.

This method of setting out a bog costs very much less than the Cape Cod method, and the result in looks is very much inferior. The vines, however, grow excellently well, better, indeed, most growers now say, than in sand, and the runners strike root as readily in the mud as they could in any other soil. The weeds are a nuisance, and here our eastern friends have the advantage, for they are more easily controlled in the

sand. However, as the vines cover the ground they drive out most of the other plants, and the stubborn fighters, like Ferns, Sedges and Briars, are gradually exterminated. Some fine Grasses are not meddled with at all. They do not seem to prevent the growth of the vines, and, in fact, are considered rather a benefit, since these grassy patches bear the largest and safest crops. They are less liable to "scald"—the Jersey grower's most dreaded enemy—and they seem protected from many of the climatic difficulties which afflict their cleaner neighbors. A New Jersey bog is never as clean as the Cape bogs, nor usually even as clean as they should be. They bear quite as heavily, however, and after all that is what the farmers are looking for. In the east vines are kept short and re-sanding is done every few years. In New Jersey vines are often allowed to grow until they form a mat a foot thick, and individual vines may be several feet long. In some seasons these vines bear enormously; but they are not so safe for an annual crop as shorter vines. Instead of sanding, many growers mow the vines when they become too rank and so get a new and vigorous growth from old roots.

New England has perhaps the oldest cultivated bog-land, but there are many old bogs in New Jersey as well. Farmers are not entirely exempt from all human weaknesses, and some years ago, when the conviction prevailed that cranberries were a sure road to wealth without much work, Cranberry-land rose enormously in value, and all land was Cranberry-land if it was only in a Cranberry-region. Vines were planted on hill-sides, in sand-holes, in swamps, everywhere in fact. The inevitable reaction came. Insects and other pests eliminated the badly placed plantations and others were abandoned from want of knowledge. I have tramped in rubber boots over bogs on which thousands of dollars were spent which never yielded a dollar, and which now are so overgrown with brush as to leave no trace of cultivation. Naturally, New Jersey is much more favorably located for Cranberry-culture than Cape Cod. Our land is at least equally good, and our seasons are longer. We do not fear frost as early, and our vines get an earlier start. There is not that necessity for looking to early maturity in the berry which has made the Early Black the favorite on the Cape. For color and appearance the Early Black eclipses the ordinary New Jersey berry; but the latter is fully as good in flavor, makes just as good sauce, and has the enormous advantage of keeping well. New Jersey growers usually count on giving the east the early market, sending in only their dark varieties, which sell as Cape Cod berries and at the same price. The bulk of the crop is housed in special cranberry-houses, in which the berries are so packed as to season thoroughly. When Cape Cod berries are out of the way our berries take the market. The color is good, the fruit is usually sound, there is no undue competition, and the berries bring whatever the market will stand.

In describing the separation of berries, Professor Bailey does not refer to "bouncing." In picking late, or over scalding bogs, some soft berries will get into the boxes. To eliminate these, the berries are poured over an inclined screen and allowed to drop on a smooth board, beyond which is the receiver. The sound berries come down with a rush, strike the smooth surface and bound into the receiver. The soft berries come down with a thud, but have no "bounce" in them, and remain on the board, swept off at short intervals by the screeners.

Thus Cape Cod and New Jersey produce the same fruit by quite different means of cultivation; but they are not competitors, for while the Cape has looks and flavor it must sell early, as the fruit does not keep well. New Jersey sells its dark berries as Cape Cod fruit, and keeps its best until the eastern berries are gone and then supplies the market according to demand.

Of late years our growers have paid more attention to developing varieties, but, while they look after size and color, they retain keeping quality as an essential, and the varieties are still too little fixed or cultivated to merit notice here.

The systems of picking are different in New Jersey from those in use on the Cape, but that does not prevent their getting in the berries as effectually.

Rutgers College.

John B. Smith.

I insist upon it that a plan complete in every detail should be adopted at the beginning and followed throughout. To be sure, in certain circumstances I should not hold to this latter point; for, given a fixed leading idea, the artist, during the progress of the work, ought to feel himself free to study his materials anew, . . . to modify his ideas of the details, or even to abandon them wholly or in part in case better ideas should come to him.—Pückler-Muskau.

A Bit of Forgotten History.

OUR valued correspondent, Herr Carl Bolle, of Berlin, recently published in *Gartenflora* an interesting article called "When Did the Weymouth Pine First Appear in Europe?" Weymouth Pine is the name commonly given in Europe to our White Pine (*Pinus Strobus*), and records the well ascertained fact that it was first made generally known in Europe by Lord Weymouth at the beginning of the last century. Specimens were brought to England in 1705, and almost immediately Lord Weymouth devoted himself to the cultivation of the tree, which from that day to this has been extensively planted in different parts of central Europe.

Herr Bolle has no wish to strip the memory of Lord Weymouth of the credit which thus attaches to it. His object is simply to show that, although this nobleman first popularized the White Pine, it had, contrary to the common belief, been seen in Europe much earlier. On general principles, he explains, it is unlikely that its importation can have been so long delayed, for other North America conifers had been introduced much sooner, as, for instance, the Bald Cypress before 1640 and the Red Cedar before 1664. Moreover, there is actual evidence of an early although merely passing attempt to cultivate the White Pine in Europe.

The first modern scientific treatise on conifers is the *De arboribus coniferis, resiniferis aliis quoque nonnullis sempiterna fronde virentibus*, which appeared at Paris in 1553, and was written by Pierre Belon, a physician and a traveler of wide experience. In this book, in the chapter headed "Pinaster," there may be found, suggests Dr. Bolle, a sure indication that *Pinus Strobus*, as well as *Thuya occidentalis*, were already growing in at least one garden of France. Inspired by the maritime achievements of the Spanish and Portuguese, and attracted by the rich fishing grounds of our northern coasts, French explorations of America began early in the sixteenth century. Even sailors were interested by the immense and varied forests of our coast regions, and, although botanical knowledge in the modern sense had hardly yet been born, there was everywhere in Europe a keen desire to find new plants with medicinal virtues. It is recorded that a disease which afflicted, among other less popular patients, Pope Leo X., Francis I. and Ulrich Von Hutten, was treated with a medicine in which sarsaparilla was mingled, with a decoction from the "Canadian Tree-of-life" (*Arbor vitæ*) and other exotic extracts. At this same period navigators were bringing from Canada great packages of a white, very light wood, somewhat spongy in texture and still covered with its bark. This they grandiloquently called the "second Tree-of-life," loudly praising its medicinal properties. After investigating it, Belon pronounced it useless, and, indeed, harmful, as likely to supersede really valuable medicaments. He expressed amazement that other physicians should have allowed themselves to be deceived by impostors to such a point that they had in their turn imposed upon even King Francis himself, and declared the high-priced stuff to be merely "Pinaster wood." By this name is not to be understood what we now call Pinaster, *Pinus Pinaster*, the tree which grows so plentifully on the *landes* of south-western France. But Belon's Pinaster, says Herr Bolle, was a tree which he thoroughly understood and has accurately described—*P. Cembra*, the familiar Pine of Switzerland, and long supposed to be the only European Pine whose leaves grow in groups of five. Misled by the arrangement of the leaves and by analogies of habitat, Belon seems to have thought he recognized this tree again in a small cultivated specimen which was shown him as having grown from seed in one of the royal gardens at Fontainebleau. His description runs as follows: "At Fontainebleau there stands, with evergreen needles, a little Pinaster-tree. When I saw it I recognized it as such at the first glance, by its stem as well as by its branches, its bark and other signs. This specimen has reached man's estate in five years. Its branches stand around the stem in just the same arrangement as on the Spruce and the Fir (*sapino et abiete*), cross-shaped at regular intervals. It has leaves like the Pine but thinner; these stand in bunches, sheathed below in a tube, five or six together and perpetually green. The carefulness of Mother Nature is unmistakably proved by the manner in which this tree buds in spring. That is, it develops five buds (shoots?) at the end of each twig, the central one of which is larger than the lateral ones. From this there then develop further leaves and fruits. By comparing the description of this tree with the tree native to our mountains their identity will be recognized. The specimen at Fontainebleau has not yet borne fruit." Belon then adds that he had collected seeds of *P. Cembra* in Savoy, and obtained plants from them which were identical in appearance with the little tree in the king's garden. To-day, comments Herr Bolle, every cultivator is

familiar with the great resemblance between young plants of *P. Cembra* and of *P. Strobus*. "Nothing is more pardonable than to confuse the two." The little exotic stood unique at Fontainebleau, where, as is well known, the true "Tree-of-life" of the North American provinces was cultivated. By comparison with this it continued to be called the "second Tree-of-life" (*altera arbor vitæ*), probably on account of the fact that their common origin was known, although not specially dwelt upon.

It thus seems probable that it was a White Pine which Francis I. possessed in a living state. Those who question the fact, says Herr Bolle, should consider that Belon's phrase, "thinner" or "very thin leaves" (*folia exiliora*) does not apply to *P. Cembra*, but does in the most decided way to *P. Strobus*.

There were other enthusiastic horticulturists in France at that period who loved to crowd their gardens with novel exotics. But in no record of their collections can the slightest indication of the presence of *P. Strobus* be found. The little tree of Francis I. must have soon disappeared without leaving trace or seed behind. And though the Hollanders, who so long possessed large portions of our country, may well have sent specimens of this striking Pine home to the impassioned horticulturists of their mother-land, no statement of the fact can be found. Pierre Belon's description of the *altera arbor vitæ* at Fontainebleau is the only proof we have of the existence of *P. Strobus* in Europe prior to 1705. But in Herr Bolle's opinion this is enough to carry back the European story of the tree a century and a half beyond the commonly accepted date.

Two Remarkable Catalpa-Trees.

THE tree shown in the illustration (Fig. 68, p. 537) is a Catalpa (*C. bignonioides*), and one of two trees growing on the old P. C. Brooks place in West Medford, Massachusetts. These trees were set out on April 24th, 1809, and owing to their favorable situation have attained a remarkable size. They stand on the south side of the house and are well protected from the winds in winter. Two spouts conduct the water from a large portion of the roof directly to the roots. The tree shown in Fig. 68 is the more interesting of the two. The trunk is nine feet eight inches in circumference at four feet from the ground; it is about forty feet high and has a spread of fifty feet. At four feet from the ground four branches radiate from the trunk, two of which, on the south side of the tree, drop toward the ground until they touch it, and at this point they have rooted and thrown up four or five young shoots, two of which are over three feet in circumference at two feet from the ground. This first rooting of the limbs is but ten feet distant from the stem. The trailing branches extend in various directions over the turf from these first two clumps of shoots, throwing up shoots like huge suckers wherever the old limbs have rooted until a small forest of young Catalpas has been formed under the shade of the parent tree. There is no record of when this peculiar habit first developed, but it must have been many years ago. All the limbs that connect the young tree to the main trunk have been dead for many years, but the wood is still perfectly sound.

The second tree (Fig. 69), standing to the eastward of the one described above, although not so interesting, is a large Catalpa for this region. The trunk is ten feet in circumference at two feet six inches from the ground, and the tree is about fifty feet high and has a spread of thirty feet. A heavy gale took out more than half this tree some years ago. The new branches from the old wound are now sweeping the ground in much the same manner as do those of the sister tree, whose rooted branches cover an area of 300 square feet.

West Medford, Mass.

Henry Brooks.

Foreign Correspondence.

London Letter.

CRINUMS.—The genus *Crinum* deserves to fill a much more important place amongst cultivated bulbous plants than it does now. Of the eighty or so species described fully forty are known to be in cultivation, and of these at least a score are possessed of characters sufficiently striking to find general favor. They are not as a rule difficult to cultivate; they flower freely, some species several times a year, whilst their flowers are large, handsome, and almost invariably sweet scented. In England the only representative collections of *Crinums* known to me are at Kew, and in the garden of Sir Charles Strickland, Baronet, at Malton, in Yorkshire. Sir Charles has made a specialty of *Crinums* and several other genera of *Amaryllidaceæ* for many years, cultivating them with conspicuous success, and carefully noting the peculiarities of each under

artificial treatment. He is consequently an authority on garden Crinums. Recognizing this, the Royal Horticultural Society invited him to read a paper on Crinums at the meeting held on Tuesday last. The paper was far too short, considering how little is known of Crinums by horticulturists generally. Still, it served to bring the plants into notice, the drawings of some of the rarest of the species cultivated by Sir Charles affording some idea of the character and ornament of the genus.

Dean Herbert was a keen admirer and grower of Crinums, as may be seen in his book on *Amaryllidaceæ*, wherein forty-six species are described, almost every one of which he appears to have had in cultivation. He also describes no less than twenty-three hybrid Crinums, the number being soon increased to thirty-two according to Sweet's "British Flower-Garden."

A very remarkable fact, and one which intending breeders of Crinums should make special note of, is the statement made by Herbert that "all the hybrid Crinums raised between *C. Capense* and the tropical species are hardy enough to stand out-of-doors against the front wall of a stove, where, if a mat is thrown over them in sharp frosts, they preserve much of their leaves through the winter, and from May to November continue throwing up a succession of flower-stems in great perfection." The only hybrid Crinum known in gardens now is *C. Powellii*, which was raised in England about fifteen years ago by crossing *C. Capense* and *C. Moorei*. The result of this cross was the production of at least two well marked varieties, one with pure white flowers, the other with exquisite pink flowers. This hybrid is perfectly hardy in England. It has handsome semi-erect foliage, stout flower-scapes, four to five



Fig. 68.—A Remarkable Old Catalpa-tree.—See page 536.

Herbert succeeded in making such crosses as *C. Zeylanicum* with *C. Capense*, *C. pedunculatum* with *C. Capense*, *C. scabium* with *C. Capense*, *C. rubescens* with *C. Capense*, *C. speciosum* with *C. deflexum*, etc. He found that all Crinums, however dissimilar, readily intermix when brought together by human agency, and that it was only in cases of constitutional discrepancy, as, for instance, when a moisture-loving species was crossed with one which affected dry treatment, or a tropical species with one from cool regions, that the progeny of such crosses were not fertile. It is therefore surprising that not one of the hybrids mentioned by Herbert and Sweet are in cultivation now.

The first hybrid Amaryllid raised was *Hippeastrum Johnsoni* from *H. vittatum* and *H. regium*, and the second was *Crinum Goweni*, from *C. Capense* and *C. Zeylanicum*. This was raised by the Earl of Carnarvon at Highclere in 1813.

feet high, each bearing a bunch of from twelve to sixteen flowers, which are larger than those of the Belladonna Lily, and as elegant in form. The white variety has shorter scapes, but the flowers are fully as large as the pink ones, and they are of the purest white. Planted in a deep, well manured soil, in a sunny position, this Crinum increases rapidly. Mr. Gumbleton planted a single bulb which in seven years increased to about twelve, which pushed up eighteen scapes, averaging four feet in height, each bearing a huge bunch of beautiful flowers of the greatest value in the garden or when cut and placed in water. If some skilled cultivator and breeder would but take the Crinums in hand he would almost certainly produce the most valuable results in a comparatively short time. The material is at hand, its plasticity has been proved long ago by Herbert and others, whilst as an example of what may be expected we may point to the hybrid raised by Mr. Powell,

which is now admitted to be one of the most beautiful and stately bulbous plants known.

In the species themselves there is much that deserves admiration. There are thirty-five in cultivation at Kew, and of these only about one-fifth are what one would call difficult to manage. The easiest to grow and the most gigantic are among those species which do not lose their leaves annually and require plenty of water all the year round. *C. Asiaticum*, *C. deflexum* and *C. pedunculatum* have large bulbs with very thick stem-like necks, leaves four feet long by from four to six inches in width standing out like the leaves of Fourcroyas. The individual flowers of these species are comparatively small, but they are borne in great numbers on stout, erect scapes; they are white with red tinged stamens, and are very fragrant. *C. angustum* and *C. amabile* are almost as large as the first named in leaf and habit, whilst their flowers are large, deep rosy red and deliciously scented. Then there is *C. giganteum*, an excellent plant for stove borders, flowering freely, the flowers pure white, six inches across, with broad, spreading segments. *C. Careyianum* is like it, while in *C. podophyllum* we have its dwarf representation. The large flowered *C. Zeylanicum*, *C. Kirkii*, *C. latifolium* and *C. scabrum* are as easy to cultivate as Eucharis, and their many flowered heads are common ornaments in the stoves at Kew. They have somewhat urceolate flowers six inches long by about four broad at the mouth, and they are white, more or less tinged or streaked with crimson.

Distinct from all the foregoing in the form of their flowers, which are erect, with tubes six inches long, narrow, long, radiating segments and anthers standing erect, are the species of the section called *Platyaster* by Baker. Of these we grow *C. Hildebrandtii*, white; *C. erubescens*, deep crimson; *C. Americanum*, *C. Commelyni*, *C. angustifolium*, all white; *C. amœnum*, and the rare *C. purpurascens*, from west tropical Africa. This last named is said to be almost wholly aquatic in its habits. We find it likes abundance of water and a tropical temperature; with these it grows very freely, sending out its long stolon-like suckers from the base of the bulb in every direction. *C. brachyneura* has the most beautiful snow-white, waxy flowers, in umbels of about twenty on scapes a foot long; each flower is three inches across, the segments overlapping, as in the Zephyr flower, and the stamens only just showing above the narrow tube. If this species would but behave a little better under cultivation it would deserve to rank amongst the first half dozen stove bulbs. It is a native of Bombay, from whence it was introduced and flowered at Kew thirteen years ago. It has recently again been brought into prominent notice.

C. Moorei is one of the noblest of our greenhouse plants. Its stately scapes of large rosy flowers are scarcely ever absent from the conservatory in summer. Out-of-doors the common African species *C. Capense (longiflorum)* is quite at home, flowering and fruiting abundantly all the summer through.

Kew.

W. Watson.

Cultural Department.

Rose Notes.

JEAN DUCHER is a pure Tea Rose, sent out in 1874, that notable year in our Rose calendar, which also gave us Perle des Jardins and Marie Guillot. Jean Ducher is one of those exquisitely colored Roses which captivate the eye at once, a soft, silvery salmon, with heart of glowing, rosy peach. It has not been sufficiently experimented with in our country to be thrown aside, though it must be confessed that under ordinary treatment it does not open its buds well with us. Its very attractive coloring should win for it a more careful trial.

Another beautiful Rose in this same line of rich coloring is Princess Beatrice (Tea), which proved such a lamentable failure as a forcing variety, but which, we believe, has never had a careful enough trial as a border Rose. Its foliage, habit and good constitution would all point to it as an ideal bedder, while its coloring is as unique as it is beautiful.

And speaking of fine bedders, probably no Rose is quite so perfect in this line as the lovely white Tea, Marie Guillot, mentioned above. So long as fine white Roses are as highly appreciated as at present this grand variety should be planted in profusion. Its flowers are very double and of a most beautiful clear white shade just touched with lemon, and very easily produced.

Ethel Brownlow (Tea) produces a bud and flower too small for popularity in our country; doubtless if it were carefully thinned out and only a few buds allowed to the plant, as is usual in England, it would make a better showing, as it cer-

tainly can be seen in fine form across the water; but with us it is a very slim, straggly grower.

Rubens (Tea) is an extremely fine white Rose, quite similar to its parent, Devoniensis, save that the bud is not quite so long as in that variety. It is more double, too, and a stronger grower; it can be found growing in many a garden under the label "Devoniensis," for it has been sent out in place of that variety in a great many cases, being so similar to it, and the dealer has doubtless excused himself by the thought that he was sending "something really better than was ordered." It is an early bloomer and a grand Rose in every way.

I am asked if there is any better white hybrid Perpetual than Merveille de Lyon. We believe it to be unsurpassed, though White Baroness is probably as good, and Mabel Morrison has only an occasional touch of color to mar its pure whiteness. These three white hybrid perpetuals and Baroness Rothschild (pink) are so absolutely perfect in form and color and texture that they can never be outdone in these respects. But in our northern and western country they are next to useless as outdoor Roses, owing to their liability to attacks of what florists call Black Spot, a fungoid disease fearfully prevalent among Roses grown in the open air.

When a Rose begins to drop its leaves and shows brown spots on their surfaces, we know that the Black Fungus is present. Scientific investigation has proved that the tissue between the upper and lower surfaces of the leaf is the point attacked, hence the difficulty of applying any solution effectively. We believe that nine-tenths of all the failures in Rose-growing in the sections named are due to this scourge. With all our investigations and experiments no remedy has as yet been found that will successfully check its development in the open ground. Sudden changes in temperature, excess of moisture, or the lack of it, seem to cause its development. Like other insect or fungoid pests, it will doubtless run its course and disappear, and there are even now indications pointing in this direction. It is a very fortunate thing indeed that many of the hybrids are of strong enough constitution to be able to withstand its attacks, though the very finest varieties seem to succumb first, and were it not for the fact that this disease is pretty well under control in our greenhouses, we should no longer be able to show perfect blooms of Baroness, Merveille de Lyon or of their very aristocratic sisters.

We have been very glad to discover a rather new variety, quite as fine as the four referred to, not absolutely white, but very delicately tinted pink, which, so far, seems proof against black spot. This variety is Madame Joseph Desbois, sent out by Guillot in 1886, a strong, free-growing variety, carrying superb blooms, very fine in the open air.

Heinrich Schultheis (a cross between Mabel Morrison and E. Y. Teas) was sent out by Bennett in 1882, and is a grand Rose in every respect, a strong grower, bearing large, double, sweet flowers of a delicate rose shade. It should be much more extensively grown in our country.

Our Madame Georges Bruant, planted two years ago in the open ground, has been in fine condition during the season, and shows no signs of mildew. It bears its flowers in about four crops, the first bloom, of course, being the most profuse. We value this Rose highly, and think that as it becomes established it loses its liability to mildew. Its clusters of immense snow white flowers are very distinct and beautiful.

Richmond, Ind.

E. G. Hill.

Notes on Shrubs.

THE common Dwarf Chestnut or Chinquapin (*Castanea pumila*) is a plant rarely met with in cultivation at the north, though it possesses qualities rendering it desirable both for ornament and utility. Its extreme northern limit of spontaneous growth is given as southern Pennsylvania and Ohio; but when transplanted to the region about Boston it is quite hardy and seems to find a climate well suited to its requirements as regards healthy growth, although it does not attain large size. Well established plants never show the least injury in the most severe winters here.

In its most favorable southern and south-western home the Chinquapin sometimes becomes a small tree and grows to a height of forty or forty-five feet, with a stem from one to two feet or more in diameter, so that its timber is of use for posts, fencing, or even for railroad ties. In sterile or exposed situations, or when it is brought north out of its natural habitat, it appears to be in about its best period of growth and development when from five to eight feet high, at which time the spread of the branches is usually greater than the height, as a number of stout stems usually arise from the same base at the root. The habit of growth of the plant is very similar to that

of our native Hazel-bushes, so well known in the north-eastern part of the continent, and hardy enough to be indigenous quite far north in Canada.

The branches of this little Chestnut are usually well covered with foliage of a rather light green color. The leaves are smooth, shining above, and covered with a smooth grayish down or tomentum beneath. In general contour they resemble those of the common Chestnut, but they are shorter, being only from three to five inches long, and they are less acutely pointed and are broader in proportion to the length. The yellowish white staminate blossoms appear in much profusion at

the nuts fall to the ground, and, if the atmosphere or ground is moist, they at once begin to germinate and put forth a radicle. Indeed, the propensity to germinate is so great that the nuts often sprout before they fall, and, as they do not long retain their vitality, they cannot be transported for planting in distant places unless packed in soil or other material which will prevent too fast drying. The difficulty of transporting the fresh seed while it retains its vitality has no doubt been a factor in preventing the wide and general dissemination which the plant seems to merit. The nuts, though small, are sweet and of good flavor, and the plants are quite prolific and usually bear



Fig. 69.—The Catalpa-tree (*Catalpa bignonioides*).—See page 536.

about the same time as those of the common Chestnut at the end of June or early in July, and at this time these Chestnut-shrubs present quite a pretty appearance when massed together. The blossoms are followed by the clusters of light green involucre, or "Chestnut-burs," which reach maturity about the 1st of October, when they open and disclose the smooth, shining, dark brown nuts.

The nuts of the common Chestnut are usually borne two or three in a bur; but those of the Chinquapin are produced singly, so that their sides are not flattened, and they are only about half the size of chestnuts. Soon after the involucre open

freely every year. By care and selection larger and finer flavored nuts than the average might easily be obtained. It seems possible that this Dwarf Chestnut might thrive in higher latitudes than this, in places where the Chestnut-tree will not live, and especially in regions where winter snows are generally deep.

The Japanese *Photinia villosa*, which was figured in the first volume of GARDEN AND FOREST (page 67), is very handsome when in full fruit, although perhaps not more showy than some species of Hawthorns or of Crab Apples at this season. The serrated, stiff, thick, dark green leaves generally cover the

branches well, and the many-flowered corymbs of Hawthorn-like blossoms, which are produced in the first or second week of June, are quite showy. On well established plants the fruit is produced in corymbs, but it is often borne singly or not more than two or three together when the plants are young or in poor condition, or when the flowers have suffered injury. It does not ripen until the middle of October, when it turns to a shining deep red or scarlet color, and remains in a bright and showy condition for a considerable length of time. When fully ripe it is of a sweet and pleasant, though somewhat insipid, flavor. It is of an oblong shape and about a third of an inch in length, much resembling the drupe-like pomes of some of the Hawthorns. The fruit itself, however, is more like that of the Juneberry (*Amelanchier*), the pulp being granular, soft and of a yellowish color, containing commonly only one, but sometimes several, large, brown, thin-coated seeds, enclosed in a very thin and fragile core.

This is another fruit which might be made useful as food if selected and improved by cultivation.

The plant known as *Pourthia arguta*, from the Himalayas and other portions of Asia, which there is not sufficient good reason to separate from the genus *Photinia*, produces fruit having a very close resemblance to that of *Photinia villosa* in form, color, flavor and texture. It ripens at the same time, although the blossoms appear about a week earlier. The color of the fruit is perhaps of a clearer, brighter scarlet than that of *Photinia villosa*, but it has not as yet been produced so abundantly on plants here. The habit of the plant is much lighter and less stiff and rigid in foliage and limb. Both apparently become large shrubs or little trees, varying in habit according to circumstances like our native Shad-bush or Juneberry.

Arnold Arboretum.

J. G. J.

Some Native Ferns.

OF the four or five Spleenworts native to New England which are useful for out-door culture, *Asplenium thelypteroides* is an important member. Its average height is about two and a half feet, and the fronds are six or eight inches wide and twice divided. Several of these nearly erect fronds come from a thick and usually forked root-stalk. It is often found in moist, shaded ravines growing with the narrow-leaved Spleenwort (*A. angustifolium*) and *Aspidium Goldianum*, but is more common than either of these. It is sometimes found in open sunlight, and in a soil which never becomes too dry it might be grown in the sun. It likes a rich, peaty soil which is always moist, but not too wet. In this it resembles many other Ferns that require constant moisture about their roots, but will not live in a wet place. The best time for transplanting is early spring, or in autumn if slightly protected the first winter. It may not make a good showing the first year, but it will soon become well established if placed in a suitable location.

Aspidium Boottii grows two feet high, with narrow fronds, on stems about half the length of the frond. It seems to grow in a peaty or boggy soil in thickets. Transplanted into a fine loam, with a mixture of peat added, it thrives finely. A heavy soil would not suit, nor would it stand a dry location. It needs shade, or partial shade, and may be transplanted in either spring or autumn.

We have in North America three species of Bladder Ferns, two of which are native to New England. Both of these are very useful for cultivation in certain localities and are among the easiest kinds to transplant. The larger *Cystopteris bulbifera*, which is common in shaded ravines, and also not rare under low shaded cliffs, is a graceful plant in midsummer, when the fronds are just matured. Its height is about two feet, and the fronds are only three or four inches wide near their base and taper to a point. But the fronds are not durable. They turn brown earlier in autumn than in most species. It propagates itself chiefly from little bulblets, which form on the back side of the rachis of the frond. These fall, take root and form new plants. A few plants set in a moist, shaded soil soon form a dense bed.

The other species, *C. fragilis*, is even more delicate and slender than the first. It is one of the first Ferns to start in spring, and its fronds die early. Even in August it is sometimes hard to find the roots, because the fronds have dried up so that they are scarcely visible. It is a common Fern on shaded cliffs and varies much. The fronds are oblong-lanceolate in shape, and grow from six to ten inches high. Both of these Ferns grow in tufts, several fronds to a plant, and have small roots for the size of their fronds. It is valuable for the rock-garden or for planting on cliffs.

The common Grape Fern, *Botrychium Virginicum*, may be

found in almost any rich woods of New England. About half way up its stem the plant divides into two segments. One, a sterile frond, is sessile, somewhat triangular in outline, of a thin and delicate texture and three or four times divided. The other, which is the fertile portion, is long stalked, and is a close, narrow panicle or frond two or three inches long by an inch or so wide. When this fertile portion has just matured it makes a pretty plant. The two parts, though quite unlike, are both very handsome. But the fertile portion is of short duration. It soon sheds its spores and withers, and even the sterile frond, though lasting usually some time after the fertile one has decayed, is of much shorter duration than that of most Ferns, for by the last of August it has usually disappeared. It is an easy Fern to grow in any ordinary rich soil in the shade, and while it lasts is one of the handsomest.

Southwick, Mass.

F. H. Horsford.

Autumn Crocuses.

THE Colchicums, usually known under this name, are too rarely seen in cultivation, as I was recently reminded by seeing in a Massachusetts garden beautiful clumps of the pure white variety of *C. autumnale*, covered with dense masses of snowy flowers. *C. autumnale* itself is of a pretty pale lilac purple, and contrasts well with the pure white variety. These plants are also known as Meadow Saffrons, owing to the fact that the anthers of the flowers of *C. sativus* furnish the Saffron of commerce. The roots also (which would appear at first sight to be bulbs, but are really corms), together with the seeds when dried, produce the drug known as Colchicum, which, though very poisonous, is a valuable medicine. *C. autumnale* is common in some parts of Britain. I well remember seeing it covering acres of meadow land with a pretty purple tinge in the autumn months, but it is probably exterminated there in that locality now, for an enterprising local firm were busy collecting the corms. Besides the two single-flowered forms of *C. autumnale* above noted, there are also double forms of both which are very beautiful, but also rare and seldom seen in catalogues, at least in America, where, indeed, it is not an easy matter to find Colchicums, for though I obtained not long ago a dozen bulbs of what were supposed to be the type, half of them proved to be white flowered.

C. speciosum is a very fine species, but so far as I can learn no one seems to have succeeded with it here in the eastern states. This plant is much larger than those already named, and of a crimson-purple color; it is, in fact, the largest of a very beautiful genus. I have never yet seen it in the bulb lists, so it is hard to find out whether it is possible to grow it or not. All the varieties of *C. autumnale* thrive well in a good, well drained soil, but should the soil be of a retentive nature they would require a liberal addition of sand. They would thrive admirably on rock-work, where they could push through other plants of a prostrate habit, for the Colchicums flower in fall; the leaves appear in spring, and about midsummer die off and the roots have a season of rest. Imported roots usually commence to flower on the voyage, and the flowers are very liable to get bruised. This, however, will only affect this season's flower; and they will probably start away all the stronger in spring for having been relieved from producing and maturing the quantity of flowers that each root produces when established.

South Lancaster, Mass.

E. O. Orpet.

Vanda Sanderiana.

AMONG the fifty species of Vanda that are known to botanists *V. Sanderiana* may be considered as the king of them all in many respects. Perhaps it has a close rival for this honor in *V. Hookeriana*, a plant so completely distinct from it in every way that one might easily be pardoned for imagining that it did not belong to the same genus. Indeed, the question whether *V. Sanderiana* was not really an *Arachnanthe* or an *Esmeralda* instead of a Vanda has been broached; but as it is usually considered to belong to the latter genus I cannot do better than conform to the general opinion.

V. Sanderiana produces stems from one to four feet high, and these are furnished with distichous, narrow, strap-shaped, recurved leaves, leathery in texture, and more or less deeply and obliquely cut at the apex. Plants which possess remarkably pretty flowers do not always produce them so freely nor so often as one would like. This Vanda, however, when well grown flowers very freely. The strong, stout peduncles are developed from the axils of the leaves, and have been known to bear as many as a dozen flowers at a time. In September I saw a plant not more than nine inches high bearing eight flowers on a peduncle; and since the individual blooms often measure four and five inches across vertically, and almost the

same horizontally, one may imagine what a splendid spectacle a large spike of this species offers. One of the chief characteristics of the flowers, and one which has reminded many of the flowers of *Miltonia* (*Odontoglossum*) *veixillaria*, is that they are flat, the sepals and petals being almost in the same plane, the lip alone projecting. The upper sepal and the two petals are almost similar; the former, however, being larger. They are roundish oval in shape, of a soft pink or lilac color, and decorated at the base with crimson spots. But it is the two lower sepals which form the chief attraction of the flower. They are much larger than the other segments and broadly elliptic. The ground color is a soft creamy yellow, becoming more subdued toward the margins, and upon this there are from seven to nine broad red veins, half of which give off branches toward one edge and half toward the other, thus giving the whole a most charming appearance. The projecting front lobe of the lip is dark brownish red with three keels in the centre, while the ovate side lobes are greenish yellow speckled with red, and the short, thick column is of a bright, conspicuous yellow.

A variety known as *Albata* appeared about four years ago in the collection of Mr. W. Lee, of Downside. It has smaller flowers, with white upper sepal and petals, which are spotted with purple at the base, where the petals also have a sulphurous tinge. The lateral sepals are yellow, with a white margin, and reddish feathered veins.

Vanda Sanderiana itself has only been about seven years in cultivation, having been introduced in 1883 from the island of Mindanao (the largest of the Philippines) by the firm in honor of whose chief at St. Albans it received its name. So great was the sensation caused by its appearance that at the London salesrooms in October, 1883, as much as 200 guineas were willingly paid for a plant less than three feet across and bearing ninety leaves. And as evidence of the great esteem in which Sander's *Vanda* is still held, I may mention that in September of this year Sir Trevor Lawrence paid ninety guineas for a plant imported by the same firm. Mr. Lee, of Downside, who a few years ago possessed one of the finest collections of Orchids in the world, had the honor of being the first to flower this *Vanda* after its introduction.

Imported plants must be carefully treated at first in order to establish them. They should be put in a warm, moist house, spread out on the stage until the leaves and growths begin to "plump" a bit. Or they may be put in pots, with clean crocks around the roots, and receive an occasional syringing until the same effect is produced. When thoroughly established they should be put in a compost of peat and moss, with which may be mixed pieces of crocks and charcoal. In spring-time growth begins, and as it increases in vigor water must be given in proportionately larger quantities. The temperature during this period may range from sixty to eighty degrees Fahr., and the atmosphere should be laden with moisture. Abundance of light without exposing the plants directly to the sun is also necessary, as it not only accelerates the growth, but also ripens the plant. A short period of rest may be given the plants in winter, but they must not be permitted to get dry, and the temperature may vary from sixty to sixty-five degrees Fahr.

Isleworth, London.

John Weathers.

Setting Strawberry Plants in Autumn.

ORDINARILY I have not advocated fall planting to any great extent, as spring-set plants generally succeed the best; but this season has been exceptional, and those who have planted early in this section are fortunate, judging from my own experience. Last spring the ground which I had intended for strawberries was in peas, and I set only a few plants of several varieties for stock, and my fruiting beds were turned under as soon as the crop was gathered. This left me to depend on fall-set plants for my strawberry-crop next season, and as soon as the peas were harvested the ground was prepared and ready for the plants before the plants were ready.

About the middle of August the ground was set with 500 plants of the newer varieties, and as they were lifted and transferred to their new quarters with a mass of soil attached to the roots so few of them felt the change that the loss was less than two per cent. Such plants, with their roots running through the soil in a natural way, are altogether superior to potted plants. These plants were set in rows two feet apart, and they have grown and thrown out such strong runners that, if left undisturbed, I believe they would have covered the entire surface of the ground before winter. Rains have been frequent, keeping the ground wet and cool—just the conditions needed for them—and they have improved the opportunity, and offer a better promise of a crop than I have ever seen in

fall-set plants. By the middle of September the bed needed attention, but when the work should have been done the ground was too wet, and the plants were left to care for themselves while the grape harvest was gathered.

The bed has just been cleared up, the runners and surplus plants removed, and the prospect is fair that they will grow yet for some weeks. I estimate the gain in setting such plants from one's own grounds as fully fifty per cent. over plants brought from a distance whose roots are divested of soil. If persons who wish to follow peas or early potatoes with strawberries would adopt this plan of setting a few plants early in spring for stock, they can generally set their new beds much earlier than if they depend on buying their plants, can have better plants and better results, but, as stated at the outset, it must be remembered that this has been an exceptional season. With hot, dry autumns, as we sometimes have, the results would be far less satisfactory.

Earliness in setting in spring or fall is the keynote to success. Stock plants set early in spring before growth commences receive little or no check, and will furnish plants for fall setting much sooner than if planted later, and the earlier plants are set in July or August the more satisfactory will be the results. Dealers do not like to sell plants before September on account of the loss of young plants, and for this reason the price of fall plants should be double that of spring plants. I have another bed set between the 2d and 7th of September which has done fairly well; but just at that time we had a week of hot, dry weather, and the plants were checked, mainly because they could not be lifted with the earth adhering as in the former case.

Montclair, N. J.

E. Williams.

Grapes in Eastern Massachusetts.

WE cultivate in our experimental collection fifty-five varieties of hardy Grapes, one vine of each, and in order, if possible, to ascertain the best varieties for family use, we have given them careful personal attention. The following, ripening in the order named, are the twelve most approved by my family: Lady, Moore's Early, Cottage, Eumelan, Worden, Wilder, Barry, Brighton, Massasoit, Lindley, Prentiss and Iona.

Lady Washington, Jefferson and many others are good, but only ripen when the growing season is longer than the average. We are located on the highest land in the city, eighty feet above sea level, with grounds protected by a six-foot, tight board fence on north, west and south, also on the north by a belt of Fir and Pine-trees. Up to the present time, October 20th, there has been no frost in our grounds. Three weeks since it appeared in the valley 500 feet north of us.

We prefer a wire trellis running north and south, with posts ten to fifteen feet apart, six feet high, and carrying five courses of wire, about equal distance apart, stretched horizontally and fastened to the posts. The vines are set eight to ten feet apart in rows eight feet apart. Although they are hardy, in our changing climate we find they do better if laid down after pruning in November and covered with earth. The fan-system of training, and the spur-system of pruning, we consider most satisfactory. The limited area of our grounds, being a city lot, made it necessary to utilize every foot of land. It is under-drained and subsoiled. The only fertilizers we have used are cow-manure, ground bone and wood ashes.

Cambridge, Mass.

Benjamin G. Smith.

A Dangerous Enemy to the Radish.

A LARGE grower of Radishes in Piscataway, New Jersey, tells me that he will be forced to give up raising this crop. His favorite sort is a mammoth white. Half of the crop or more has been ruined this season. Before the roots are a quarter of their marketable size they turn black in spots, where they shrink and often crack. An expert can go through the rows and identify the diseased roots by the peculiar yellow color of the foliage. A microscopic examination of the diseased places on the roots reveals the traces of the same Fungus, or one very closely related to it, which causes the "club-root" of the Cabbage and the "knot-root" of the Turnip. All three of these host-plants belong to the same natural order (*Crucifera*); and it is not surprising to meet with this Fungus in the roots of the Radish. Several complaints have come to the station of fields of Cabbage ruined by the "club-root." This is so named because the Fungus of a very low order causes the Cabbage root-system to become a mass of irregular, misshapen warts and knots. With the Turnip the root is more fleshy, and the opportunity for distortions is not so great. Under the microscope there are no filaments to be seen, and therefore this Fungus differs from nearly all others which prey

upon plants. About all that can be seen is a cell of the root tissue, here and there, packed full of very minute spores. In the Radish the dark portions of the flesh, which is somewhat mottled or marbled, are close around the spore-bearing cells.

It is a well known fact that when this *Plasmodophora* once gets into the soil it remains for some time, and it is not safe to grow Cabbages soon again upon infested land. In case of the Radish failure it is probably true that the land was first "seeded down" with the Fungus spores which were produced in Cabbage, as that is the plant most frequently infested with it. The land in question has long been a truck-farm, and Cabbage is one of the leading crops.

These Fungi that thrive under ground upon the roots of plants are not easy to reach with remedies. The only practicable way seems to be the abandonment of the plants subject to the attack, and in a few seasons the germs will starve to death.

Rutgers College.

Byron D. Halsted.

Adlumia cirrhosa.—This interesting and delicate plant, known by the common name of Climbing Fumitory, is hardy in this section and westward. It is biennial, and in favorable spots sows its own seed, and thus can be treated as a perennial. For covering bowers, trellises, etc., it is admirable, as, catching with its slender young leaf-stalks upon anything it can fasten to, it soon covers a shrub or trellis with its delicate foliage. It is sometimes called Allegheny Vine, and erroneously Mountain Fringe, as it is found in wet woods and delights in shade and moisture, although it will grow in open places. I find it most useful when treated as an annual, as it has no appearance of a vine or tendency to climb during its first year, while its thrice-pinnate leaves and delicate leaflets have the appearance of a Maidenhair Fern, although of a lighter color. It is of rapid growth, and most useful for decoration in the place of these Ferns where they cannot be had. It lasts longer in a cut state than the Fern. Early in the second season it starts its climbing growth, with little to remind one of its appearance the first year. It is then of little use for cutting, and where plants are required for this purpose it will be necessary to sow the seed early every year and thin out or transplant the seedlings, giving each plant room in which to develop.

Dongan Hills, Staten Island.

W. T.

Correspondence.

The Palms of the Southern California Border.

To the Editor of GARDEN AND FOREST:

Sir.—The identity of the Washingtonias which grow on both sides of the southern boundary of California is somewhat uncertain. Those of the cañons of Lower California and those of the desert on our own side of the line have both been supposed to be *W. filifera*. This species was described from plants raised in Europe from seed whose source was not definitely stated. Long after a second species, *W. robusta*, was described in the same way, the seed being said to come from California. No native tree has yet been found which could be referred to this species. It has even been suggested that it was a mere gardener's variety, a view which finds some support in the insufficient characters assigned to the species.

Mr. Watson, however, who has seen both of these Palms at Herrenhausen, and has them in cultivation in the Botanic Garden at Cambridge, is inclined to consider them distinct, and his opinion is certainly entitled to great weight.

The question then recurs as to the true habitat of *W. robusta*. Mr. Watson has learned that the original source from which European seedsmen were supplied with seed of Washingtonia was the Cantilles cañon in Lower California, while later, and a few years before *W. robusta* was proposed by Wendland, collectors began to obtain their seed from the more accessible groves in the desert south of San Bernardino. From these facts he suggests in a recent contribution (*Pro. Am. Acad.*, xxv., 136) that the Palms of the former place may be the true *W. filifera*, while those of the latter may be *W. robusta*.

Should this supposition prove true *W. robusta* would be the proper name for the only Palm known to grow within the limits of the state of California. It cannot be accepted, however, until a careful study and comparison of the trees of the two regions shall have been made by some competent botanist, which may be rather hoped than expected.

Mr. Watson and other writers call the California tree the "Palm of San Bernardino County." In point of fact, not a single indigenous Palm is known to grow in that county. They are entirely confined to San Diego County. The error is a trifling one, but may be corrected in the interest of accuracy.

San Bernardino, Cal.

Samuel B. Parish.

The Quality of Russian Apples.

To the Editor of GARDEN AND FOREST:

Sir.—As my friend, Dr. Hoskins, of Vermont, has objected, through the columns of your paper, to my opinion of the Russian Apples expressed at a meeting of the Pomological Society at Lewiston, Maine, last month, perhaps I ought to say that no one has a more sincere desire for the success of the Russian fruits in the northern part of the United States than myself; but it certainly is my duty to express my honest convictions, especially when called upon by direct question as at that meeting. It would be both unfair and unwise to pronounce any judgment that was not based on positive knowledge, or to give utterance to "a hasty and immature opinion." I have known some of the varieties mentioned, such as Oldenburg, Red Astrachan and Alexander, since my childhood, and I am free to say I rarely ate one from the very fact that there were so many other varieties that suited my taste much better. No doubt if I had lived in northern Vermont, or some other region where the choicer varieties of the Apple do not succeed, I should have relished even a half-ripened Red Astrachan.

That Russian varieties are grown in many of the orchards in the true Apple-growing region is a fact, but it is also true they are grown to a very limited extent, except in the north. Who plants an orchard of any of these varieties elsewhere?

When I speak of the Apples in question I can say practically the same of all the Russian varieties with which I am acquainted, and I have had the opportunity of testing at least thirty or forty of the varieties most prized; nor has this judgment been formed in the office alone, where samples of them are almost daily received during the fall. From the meeting in Maine I went directly to the home of Dr. Hoskins at Newport, Vermont, and I was greatly pleased with what I saw of Russian apples in his orchard. Trees of some of the newer Russian varieties were heavily loaded with fruit of handsome appearance and fair quality, although none of them would rank as dessert apples with Primate, Jonathan, Grimes' Golden, Hubbardston and many others with which nearly every pomologist is acquainted. But it is only fair to say that in the same orchard trees of Wealthy, Iowa Russet, Magog, Red Streak, Scott's Winter and other American varieties were loaded equally well, while in quality the fruit excelled that of Russian varieties.

I have no prejudice against Russian apples, and so far as the extreme north is concerned, I now say they are superior to most American kinds in the matter of hardiness. But from northern Iowa I have lately received fourteen native varieties of winter Apples from one man; all are seedlings of fair quality and good size and appearance. From Wisconsin and Minnesota there have also come apples of good quality and some that will keep until late in the spring. It is winter apples that the north now needs most. Dr. Hoskins has sent me specimens of his apples this fall, and I was much pleased with the appearance of them, but I did not find them of superior quality. Nearly all of them were very light, not heavier than Fameuse, and greatly lacking in saccharine matter, although they would be good for cooking purposes. Prolific Sweeting, which I saw bearing abundantly in Dr. Hoskins' orchard, is very pleasantly flavored, but not so rich as many of the sweet apples; however, it is to be commended in the north on account of its hardiness.

When specimens are received in this office they are not cut on sight, but such as are not mature are kept until they are ready for testing. It is no doubt true that the locality in which the varieties are grown has considerable influence on their quality. A Ben Davis grown in Maine is about worthless, as I have had ample opportunity to judge, while the same variety grown in Arkansas is large, handsome and fairly well flavored. It would be unfair to compare any variety with Ben Davis in Maine, because it is not suited to that locality; and it would be equally unfair to compare any variety suitable to the north to a Ben Davis grown in Arkansas.

The cooking qualities of an apple are important, as Dr. Hoskins says; but if we can get an apple that is rich in saccharine matter there is usually no reason why it will not cook as well as one which is "thin" and needs sugar added to give the sauce richness. An apple is no richer for having been cooked, although it may be more palatable. If a Hubbardston or Esopus apple were cooked and compared with a Red Astrachan and Alexander the difference in quality would be as clearly perceived as it was before cooking; and the difference in the amount of sugar needed in each case would be marked.

Department of Agriculture, Washington.

H. E. Van Deman.

Periodical Literature.

The October issue of the *Bulletin of Miscellaneous Information*, issued by the authorities of the Royal Gardens at Kew, contains an article on a forest-plague in Bavaria, where the Pine forests are injured by caterpillar of a moth (*Lipparis Monacha*). It appears that these caterpillars have attacked the forests of central Europe at different times during the last 200 years. They make their appearance after long intervals, but the destruction which they cause is serious. In Bavaria alone it is estimated that the loss to the revenue from woods and forests will amount next year to \$200,000, and in some of the forests attacked by the "nonnen," as the pest is known there, the excreta from caterpillars is said to lie six inches deep. The following note from the Bavarian Forest Administration on this subject is reproduced from the Bulletin:

"The Forest Department of the Ministry of Finance state that the 'nonne' plague is now extended over nearly all Bavaria south of the Danube in scattered tracts. The infested districts are estimated at about 22,000 acres. The fertility of the insect is so great, and its numbers so enormous, that the Forest Department fear that no measures of destruction are of any avail. 'We stand powerless before the immensity of the pest.' The insect attacks chiefly the Pine and Fir, with which Bavarian forests abound, but in default of these it does not despise the Beech, Oak and other forest-trees, and is even known to feed on shrubs and garden plants. It never attacks Corn or Wheat, and, curious to say, there is one tree, the Horse-chestnut, which it will not touch.

"The means of destruction are various. Forest-bonfires of worthless wood form an easy means within reach of all communes. The insects are attracted by the fire and are smothered in the smoke, but only a comparatively small number are killed. Children and boys are also sent out to destroy the insects. From September to April the eggs can be found in the bark and destroyed, and in April the very young caterpillars can be more easily killed; all these, however, are mere partial measures. The only efficient general measure seems to be the cutting down of whole forests when much infested, in which case the remedy is almost worse than the disease. One other method is used by the state, but not within reach of communes, and therefore not described in the official pamphlet. A large electric light is placed in the forest by night. It attracts hundreds of thousands of 'nonnen' to the mouth of a large funnel through which a rapid exhaust current of air is forced, sucking the insects by thousands into a hole under the earth, where they are buried. Even this is only a partial measure, for in a forest containing perhaps a hundred millions of 'nonnen' it is not much to destroy 200,000 or 300,000.

"The Forest Department consequently fear an even greater extension of the plague next year, and an even worse danger is threatened—namely, that of the 'bark beetle,' which, burrowing under the bark, is much more injurious to the wood and more difficult to kill. It is always found that where the forests are injured by any special cause the 'bark beetle' follows and attacks the injured or diseased wood in vast numbers, and this is greatly feared will be the case in 1891. Great numbers of trees are being felled, but to avoid flooding the market with timber and causing a ruinous fall in prices, contracts and agreements have been entered into with neighboring forest-owners and the large timber-dealers by which only certain quantities will be sold at a time, and prices will be maintained. The yearly 'cut' in the other Bavarian forests has also been much reduced."

The following account of the "nonne" is translated from the Bulletin for the *Münchener Neueste Nachrichten*:

"Just as men and beasts are from time to time carried off in multitudes by epidemics, which epidemics it has not yet been found possible entirely and finally to suppress by art and science, and by doctors and veterinaries, in like manner the trees of the forest are now and then attacked and destroyed by forest-insects. Fortunately these vanish, as a rule, as quickly as they come, by the operation of natural agencies. This is the only consolation we have in view of the desolate condition to which many of the Pine forests of Germany, and in particular of Bavaria, have been reduced by the horrible devouring caterpillar, the 'nonne.'

"Before now in earlier centuries our woods have been attacked by similar calamities, and yet the German forests grow green and thrive, and yield, year by year, higher rents. This may serve to calm too anxious minds and to correct the views of those who are so ready with their judgments, and who ascribe the blame of the misfortunes which have fallen on the forests solely to the forest-officials.

"However, the present visitation has nothing particu-

lar to do with the forest-training nor the new forest-organization, nor with the style of forest-husbandry in vogue, nor with the aims of modern woodcraft, for it is well known that destruction by insect plagues occurred hundreds of years ago, and therefore at a time when the trees grew of themselves in primeval fashion, and there was no question of forest-training nor of any particular forest-husbandry. Besides this, the fact is not in dispute that the destructions caused by insects are much less intense in forests of mingled broad-leaved and needle-leaved trees; but this money-loving world unfortunately insists on quick-growing Pine forests instead of safe slow-growing woods."

The report here gives a brief account of seventeen of these insect invasions with their dates, which occurred between the middle of the fifteenth and the beginning of the present century. Of these visitations the last one, which raged in the Pine and Fir forests of Lobenstein, Schleiz, Ebersdorf and Saalburg from 1794 to 1797, worked vast destruction, so that the loss was reckoned at 2,000,000 cords of wood. "Bechstein, in his *Forest-Insectology* (1818), describes the great destruction caused by the 'nonne' caterpillar in 1794-97 in Vogtland, Lithuania and west Russia, and gives figures which correspond exactly with our present situation. Seventy-two years ago he wrote as follows:

"'It is horrible to travel in districts where these caterpillars swarm. Many thousands crawl up and down the trees. One cannot take a step without treading on a number of them. There is a perpetual rain of their excreta, which often lies six inches deep, and being dissolved by the rain, collects in puddles, which diffuse a pestilential stench. One can form no idea of the magnitude and terrible nature of the destruction. Fortunately, Nature herself stopped the pest through a kind of dysentery which attacked the caterpillars in the beginning of June, 1797. This deadly sickness was attributed to a kind of mildew. The caterpillars collected together in great thick clumps four to six inches across, the excreta became pale, the intestines dirty, and so they died, leaving behind them a disgusting stench.'

"As to the measures of prevention and suppression of that day, they hardly differed from those in use now. Bechstein, in 1818, recommended, first, protection and encouragement of insectivorous birds; second, protection of useful insects which attack and pursue the "nonnen"; third, scraping the eggs off the trees with brooms and scrapers with long and short stems; fourth, picking off the moths, caterpillars and cocoons (in 1796 the Prussian district administration at Hof caused 1,838,000 female butterflies to be caught, and paid six kreutzers for every thousand); fifth, the lighting of a number of small bonfires on dark nights (for it is well known that butterflies are attracted by the moonlight), and they paid in Bayreuth in 1796 for one night's maintenance of fire and bringing wood five groschen; sixth, isolation of the districts attacked by broad paths and ditches; seventh, cutting off in March and April of the branches nearly to the vertical and burning them; eighth, cutting down of whole standing trees, and burning of the branches and bark; ninth, removal of moss and litter from the forests and burning, if eggs or caterpillars are found therein.

"In connection with the injury caused by the 'nonnen' in this century, we may briefly mention here the extensive plague of 1839 and 1840 in upper Suabia (Württemberg), which ravaged many hundreds of 'morgens' of Pine forest. The same thing was repeated in 1855, and at the present moment is appearing almost in the same spots in a very serious manner. But the most considerable 'nonnen' pest of all took place in Russia, and spread from 1845 to 1868 in a most devastating manner over Poland, Lithuania and east Prussia. The invasion in east Prussia began suddenly in 1853, in the night of July 29th-30th, and covered a superficies of about sixty German square miles in the administration of Gumbinnen, after it had already crossed over in 1851 and 1852 the southern boundary of the administration of Königsberg. At that time the moths were driven by a storm into the sea while on their way, so that the insects were thrown by the waves upon the coasts for a distance of ten German miles in a bank seven feet wide and six inches thick, and were used as manure by the coast inhabitants. The extent of the ravages in Russia at that time was 6,400 German geographical square miles, and in east Prussia 600, making a total of 7,000 miles. At the very least, 55,000,000 Prussian cords of wood, or 185,000,000 cubic yards of wood, became the prey of 'nonnen' and bark beetles.

"The examples given suffice to show that the 'nonnen' have made their appearance in former centuries in large numbers, and have generally disappeared with equal suddenness. The present catastrophe will likewise come to an end after causing heavy losses, though it may possibly return many

years later. But we possess no radical remedy against the caterpillar, and it seems doubtful if we shall ever find one. At all events, it is the duty of the forest-managers, forest-owners, the Government and the whole population to come to close quarters in every possible way with this dangerous visitor, even although Nature herself up till now has proved the best helper, and may continue so in future."

Notes.

Spiraea prunifolia is less desirable than many other shrubs of this genus, but its autumn coloring is remarkably vivid. This year it has been conspicuous for the bright crimson of its foliage.

A writer in *Gartenflora* says that a few sprigs of Rosemary laid among woolen clothes will effectually protect them from moths. New expedients for this purpose are worth trying, now that the price of camphor has risen so greatly.

The western range of the Hemlock has been still farther extended, a tree having been lately found by Mr. J. F. Bartlett, of Brainard, Minnesota, on the right or east bank of the outlet of Pokegama Lake, that is, near the north line of Section 15, Township 55, Range 26, west, in Minnesota, and seventy-five miles north-east of the intersection of the Wisconsin line with the St. Louis River.

We have received from the Minister of Agriculture and Commerce of Italy a copy of the "Annuario Generale della Orlicoltura in Italia" for the current year, a directory of the horticultural societies of the kingdom and their members, of the botanic gardens and schools of agriculture and forestry, with some cultural memoranda relating to new plants and other information of special interest to Italian botanists, gardeners and foresters.

In connection with the interesting notes on "Grapes in Eastern Massachusetts," which appear in another column of this issue, it may be well to state that the method of cultivation practiced by Mr. Smith seems to be justified by the results attained. At the exhibition of the Massachusetts Horticultural Society last month he obtained the first prize for Grapes of the following varieties: Wilder, Barry, Prentiss, Massasoit, Lindley and Brighton.

Experiments at the Iowa Agricultural Experiment Station seem to indicate that lime, added to mixtures of London purple and Paris green, greatly lessens the injury which these poisons inflict upon the foliage of trees sprayed with them. About a bushel of lime is put in a barrel and covered with water until it is thoroughly slaked. The mixture is stirred until it is very milky, and as much is added to the arsenical preparations as can be used without clogging the sprayer.

In the valuable article on American Grapes, by Mr. T. V. Munson, which appeared in the issue of this journal for October 1st, the name *Vitis palmata* was used to designate the plant called *V. rubra* by Mr. Munson. This change was for the sake of uniformity, as the plant had been figured and described as *V. palmata* in GARDEN AND FOREST (vol. ii., p. 340). It should have been stated that the change was not authorized by Mr. Munson, and that he prefers the name *V. rubra*, which he has used in other publications.

The Chrysanthemum Show of the Philadelphia Horticultural Society, which is to be held next week, beginning on the evening of Monday, November 10th, and continuing until Friday evening, bids fair to equal the best of the Philadelphia exhibitions in former years. The entries have been numerous, and the display of new seedlings will be unusually large. Exceptional interest is manifested in the award of a special premium of fifty dollars offered by a member of the Society for the best seedling Chrysanthemum, no one being allowed to compete except the veteran growers, John Thorpe, of Pearl River, New York, and W. K. Harris, of Philadelphia.

The New York Forest Commission will hold a meeting on November 5th, at eleven A. M., at the office of Sherman W. Knevals, Esq., 32 Nassau Street, New York, for the especial purpose of discussing the establishment of an Adirondack State Park, in pursuance of the resolution passed by the Legislature of 1890. In order to avail themselves of the opinions and suggestions of all parties interested, the Commissioners invite representatives from all clubs, preserves, sanitariums and other associations now existing in the Adirondack region, to meet with them for the purpose of mutual consultation and informal discussion.

A correspondent of the *Gardeners' Chronicle* recently wrote: "I have to-day flowered a *Cattleya aurea* that has two flowers to the spike; one is distinctly *C. Dowiana*, with the purple on the sepals and the gold veins on the lip distinct to the very edge; the other flower is *C. aurea* without any purple markings on the sepals or petals, and the gold veins at the sides of the lip widening until the purple disappears. I mention this to show how absurd the naming of slight varieties of Orchids is. I have been flowering some of the best looking *C. Dowiana* I ever saw, but have not been fortunate enough to find a single Hardyana among them. From experiments I have made I am convinced that a clear light has much to do with the intensity of the coloring of these Cattleyas; and some whose petals are mottled with rose or purple when suspended close to the glass in a good light will have no red coloring on the petals if kept in a shady place."

Monsieur Lemoine, of Nancy, sends us a colored plate of another series of four of his new hybrid Gladioli. There are two of the Nanceianus hybrids: Le Grand Carnot, with very large bright, orange-scarlet flowers, with conspicuous, sulphur colored spots on two of the lower segments and shaded with purple toward the interior; Harry Veitch, with dark maroon-red flowers, the lower divisions marked with straw colored and bright red spots. Two new hybrids of the Lemoinei section complete the group. They are: Alice Wilson, with large, well-formed flowers with reflexed segments, displaying the interior, which is cream colored, slightly shaded with rose. Another of the same class is Nuée Bleue, with smaller, violet-blue flowers, marked with large, darker violet spots, separated through the middle by a yellow ray. Several more new Nanceianus hybrids are sent out this year from the Nancy nursery, including Dr. H. P. Wolcott, Kléber, Masséna, Undine, and Professor Sargent.

In an account of a conversation recently held with Colonel H. Gardner, the special agent of the Census Office for the collection of statistics with regard to viticulture, a correspondent of the New York *Sun* reports him as saying that "there are in round numbers 400,000 acres of land in this country planted to vineyards, of which 300,000 will be in bearing this year. This is an increase of 220,000 acres in vineyard area during the past ten years, and an increase of over \$10,000,000 a year in the capital invested. Of the area of bearing vines in the country, California alone has 150,000 acres, including 25,000 acres of Raisin-grapes. That state also has of the total investment of capital nearly \$78,000,000. Between 30,000,000 and 40,000,000 gallons of wine will be made in the United States this year, of which California will produce more than half. Seven-eighths of the grapes of California go to the wine press. Four-fifths of the grapes grown in all the rest of the United States are for table use. California alone grows the Raisin-grape."

Bulletin No. 12 of the United States Department of Agriculture is devoted to an account of the "Grasses of the Southwest," with plates and descriptions by Dr. George Vasey of the species peculiar to the desert region of western Texas, New Mexico, Arizona, and southern California. The region embraced in this work so far as the valleys are concerned is principally a desert. Grasses are scanty, not in variety of species, but in distribution. Some are short-lived, springing up after summer rains, maturing rapidly, and then disappearing. The perennial species grow generally in bunches, with roots which penetrate deep into the soil and thus enable them to withstand the effects of protracted drought. Grasses nowhere form a dense sod as they do in regions of more equally distributed rainfall. As Dr. Vasey points out in his introduction, the most important agricultural question before the people of this region is how to increase the production of Grasses and other forage plants. The Department of Agriculture is endeavoring to solve this problem by means of various experimental farms situated in different parts of the western and south-western parts of the country, and the sensible opinion seems to be gaining ground that if any Grasses can be profitably cultivated in this arid region it will be some of the native species, which naturally are better fitted to support the hardships of the peculiar climate than others developed under more favorable circumstances. The first step, naturally, in experiments with the native plants of a country is for the experimenter to learn something about them, and this he will be able to do by the aid of this work, which admirably accomplishes its purpose through the capital illustrations and Dr. Vasey's descriptions. Fifty plates are given in this first part, which are to be supplemented by fifty more, now in course of preparation. The plates are from drawings made chiefly by Mr. William R. Scholl.

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The Axe in its Relation to Ornamental Trees.

IT is a curious fact that Americans, who have destroyed more trees wastefully and foolishly than the people of any other country, and have stood and seen their forests, the envy of the rest of the world, swept away with hardly a voice raised in protest, are more unwilling than other people to use the axe in cases where the cutting of trees is really essential. A hundred square miles of forest may be swept by fire from some mountain range through the carelessness of an idle hunter, a mountain stream may be ruined, and the fertility of a smiling valley threatened. It is all taken as a matter of course, and is looked on as one of those unfortunate occurrences which the community is powerless to prevent. The forests of the national domain are robbed of their timber, and the public is satisfied with the simple acknowledgment of the general government that it has not the power or authority to protect its own property against the organized bands of plunderers who have been preying on it for a quarter of a century or longer. This indifference to trees when they are composing elements of the forest is a marked feature in American character, and is all the more marked from its contrast with our feelings about trees individually, especially trees which we have planted ourselves or have seen planted. When a tree is cut in one of the parks of this city there is a protest raised against the so-called barbarity of the act by a hundred voices which are silent about the destruction of the Adirondack forests. The protest in the one case is as much the result of ignorance and indifference as the silence in the other; and it is as necessary to use the axe, if the beauty and value of ornamental plantations are to be maintained, as it is to save the forests on the headwaters of important streams.

Most people hate to see a tree cut on the grounds which surround their homes, on the borders of the highway, in parks or squares or other public places. This is one of the principal reasons why, out of the millions of trees which are planted or spring up naturally every year in the eastern states, so few ever reach maturity or develop their true beauty.

It is a rare thing in all the more settled parts of the country to see a well grown tree. The soil and the climate are

favorable, nevertheless, to the growth of trees; the variety which can be grown is very large, and trees have for many years been planted in great numbers in and near the towns of all the eastern states. The poverty of results obtained from the labor and money which have been expended in the embellishment of towns and of country estates by planting can, in most cases, be traced to the dread of using the axe. This is a fact which cannot be repeated too often or insisted on with too much emphasis. An Arbor Day is now devoted in nearly every state to planting trees. The custom is a good one in so much as it draws the attention of the young to trees and to their value; but the mere setting of trees in the ground is by no means all that is required in successful tree-culture, and some part of Arbor Day ceremonies might well be devoted to the care of trees already growing by supplying them with sufficient light and space for their requirements.

It is not very easy to lay down general rules for the proper thinning of trees in ornamental plantations, under which title we include all trees which do not grow in the forest. It is an operation dependent on judgment which can come only from experience; and it must depend on local conditions, such as the character of the soil occupied by the plantation, the nature of the trees which compose it, and the object which it is intended to serve. This much, however, can be said: no tree can grow into a thing of individual beauty unless it has from the beginning of its life sufficient room for growth in all directions. The branches of two trees not only should not be allowed to touch until they have reached their full size, but there should be sufficient space between them to enable the light to penetrate to the lower branches of both trees. When it is the object of the planter to produce eventually the effect of a grove or of a dense wood, it is necessary to keep the young plants sufficiently separated to permit the growth of lateral branches for many years. If this is not done, the individual trees lose vigor, become stunted and die early, and the object of the plantation is not accomplished.

It is a very common thing to find a plantation made to screen some unsightly object, like a building, a highway or the boundary of a park, fail to accomplish its object. The foliage is all at the top of the trees, the unsightly object it was intended to hide appearing between their trunks. This is the inevitable result of insufficient thinning when the plantation was young. The answer which people almost invariably make to a suggestion to thin one of these border plantations is, that if it is done the unsightly object will be brought into prominence. On the contrary, it is the neglect to thin that destroys the value of the trees for the purpose for which they were planted. It is difficult to make people comprehend that one healthy, well branched tree covered with leaves is more valuable than half a dozen small, stunted trees deprived of their lower branches and furnished with scanty foliage, or that crowding will produce this result. It is extremely difficult to make people look ahead in the matter of trees or to see in their mind's eye a tree twenty or thirty years after it is planted.

There are some varieties of trees which are more valuable than others on particular soils, and there are always in every plantation some individuals more promising than others. In thinning, those varieties and those individuals which promise the longest lives and the greatest beauty should be spared and the others destroyed. If a man is curious about trees, he will naturally preserve the specimen of a rare species and sacrifice common trees. One man may prefer to have his home surrounded by conifers, and another by trees with deciduous leaves. The successful thinning of a plantation depends on knowledge and taste. The more the man who is entrusted with planning work of this sort knows about trees, therefore, the more successfully the work will be done. Such knowledge is gained by experience, by being among trees, by thinking of them in their various aspects, by living with them and

loving them; and this is the best time of the year to consider trees with the view of improving their condition by the aid of the axe. The best time to examine them is just as the leaves have fallen and while the weather is still pleasant, and to mark for future cutting all that are doing more harm than good, and which are, therefore, better dead than alive.

But work of this sort must not be done hastily or carelessly. It is much easier to kill a tree than it is to rear one up; and the wise man does not cut a tree until he has considered the result of doing so from every point of view. It is best to hesitate in every doubtful case, and to think the matter over again before the axe is actually laid at the roots. There is, however, a great difference between the careful consideration of a matter of this sort and entire want of action; and as a general rule a man rarely makes a mistake in cutting too much or too often. If an error is made, it is in the other direction; and too little action rather than too much is the destroying element of our plantations.

A familiar phrase in the mouths of many people is, "I cannot bear to cut a tree, I love trees too well." The person who utters it does not love trees intelligently, and does not take the trouble to devote even a few minutes of serious thought to them and to their requirements. The man or woman who really loves trees soon learns enough about them to realize that there is not room enough for all that are planted or spring up, and that the kindest thing which can be done for a tree is to help it in its hard struggle for existence. The true lover of trees uses the axe freely, and the outcry against its use springs from sentimentality based on ignorance. There is no better week in the year than this to begin to learn about trees and their needs, or to determine if the axe cannot be used with advantage to the trees we encounter in our walks abroad.

A FORTNIGHT ago, among the numerous seedling Chrysanthemums raised by Mr. John Thorpe, Pearl River, New York, there was a long frame filled with plants which had been produced by crossing the varieties *Roi des Précoces* and *Gloriosum*. With half of these seedlings *Gloriosum* was used as the seed-parent while *Roi des Précoces* furnished the pollen. With the other half the process was reversed, *Gloriosum* in this case furnishing the pollen and the early variety being used as the seed-parent. The plants were not mixed indiscriminately, but the seedlings of each kind were massed together, and the striking fact which appeared was that the line between these two classes of seedlings was as distinctly marked as if they had been different species of plants. At one end of the frame the plants which had originated with *Roi des Précoces* as the mother plant had bold foliage and stiff stems with the flowers all standing face upward. In the other, the foliage was more delicate and the stems were weak and bent down under the weight of flower-buds. In both cases the influence of the male parent could be noted in the character of the flower, although the *Gloriosum* type of flower seemed to be the most prevalent.

The result exhibited here suggests the question which has been often asked whether there is any special class of qualities mainly transmitted by the male parent and another class of qualities mainly transmitted by the female parent—that is, if we desire, for example, to cross a specially hardy plant with one which is more delicate in constitution, although it possesses other qualities which we wish to transmit in the cross-bred plant, which variety shall we use for seed and which for pollen? If a hundred seedlings should be selected from a Tea Rose which had been fertilized with the pollen of a Hybrid Perpetual Rose and a hundred more with the same Hybrid Perpetual fertilized by a Tea Rose, which of the two lots would be likely to have more of the fragrance of the Tea or of its particular coloring? Which lot would be likely to excel in hardiness

and possess the constitution of the Hybrid Perpetual and its habit of growth?

This is only one of the questions which are of interest to the hybridizer. The great majority of crosses are made haphazard, and perhaps the best of them have been the result of mere chance. There are a few experts who, by long trial, have discovered certain principles, which, perhaps, they can hardly formulate, but which must guide them in their selection. There is no doubt but that Dr. Walcott or Mr. Thorpe or Mr. Harris could produce a larger percentage of valuable seedlings in crossing the Chrysanthemum than could any one with less experience; but after all, there is so little absolute knowledge of the subject that it may be doubted whether anything more than a very few of the most general laws can now be formulated. Of course, if there are any special principles we can hope at last to know how to make our crosses if we wish to produce a certain effect in foliage, or if we wish to originate a fruit with a certain flavor or form or color, and the same is true, if we wish to improve plants, in regard to hardiness of constitution and adaptability to certain soils and certain regions. Perhaps, after all, there are secrets here and in the breeding of animals which Nature will never reveal. However that may be, here is one field in which careful experiment with recorded results seems to have been sadly neglected.

Evergreens in the New Jersey Pine Region.

THE evergreens of the Pines are so abundant in certain localities that the foliage of the deciduous trees is scarcely missed in winter. Extensive swamps of White Cedar (*Chamaecyparis thyoides*) form broad, irregular belts of unbroken green, bordered with many low-growing, broad-leaved evergreens. Here, protected by the Cedars, we find that all the younger trees of *Magnolia glauca* hold their leaves until spring. In the south it is entirely evergreen, while here it is only partly so.

The broad-leaved Laurel (*Kalmia latifolia*) is here quite tree-like, often from fifteen to twenty feet in height, with lower bushes growing among and all around them. These thrifty younger clumps are very beautiful. Some of these shrubs have much broader and more glossy leaves than others, and the color of the young branches is a marked feature. Some have twigs of a bright yellow, others take on various shades of red, which, contrasting with the dark, shining foliage, is very effective. The narrow-leaved Laurel (*K. angustifolia*) is also here in abundance.

The Hollies attain their greatest perfection in the moist soil near these great Cedar-belts, especially near the coast, where the trees are from six to seven feet in circumference, and fairly ablaze with their scarlet berries, while beneath them their relative, the Inkberry, with shining black fruit, grows in profusion.

The little shrub, *Cassandra calyculata*, is here, with its flower-buds strung all along the terminal branches in the axils of the small evergreen leaves, ready to open on the first warm days in winter.

One of the most charming of all these smaller shrubs is the Sand Myrtle (*Leiophyllum buxifolium*), which in these moist places attains the height of three feet, while in the more open dry barrens it scarcely reaches a foot in height. This pretty little evergreen has an abundance of small shining leaves, and in May its top is covered with flat clusters of small white flowers, with ten exserted stamens with purplish pink anthers.

The Bayberry retains its fragrant leaves here until late spring, the old leaves mingling with the new as if loath to give up their hold. And the evergreen Smilax is climbing over the deciduous shrubs, clothing them with its broad, thick leaves.

The Arbor Vitæ (*Thuja occidentalis*), the White Cedar of the north, is mingling with the trees and shrubs along this moist belt, but more as a shrub than a tree of any dimensions.

Turning our attention to the ground, we find charming evergreen herbaceous plants in these moist places. One of the most lovely is our Pine-barren Pyxie (*Pyxidanthera barbata*), a little prostrate plant, growing in thick mats with small green and purplish leaves, and in early spring covered with a profusion of pink buds and white flowers.

The Xerophyllum attains its greatest perfection in these damp barrens, where it is a stately, fine plant. It consists of a thick mat of narrow, grass-like, reclining leaves, from a foot to eighteen inches in length. These clumps are quite ornamental in winter, and they are decidedly so in May, when they send up a flower-stem three or four feet in height, surmounted by a dense head of showy white flowers. Sometimes several stems arise from one clump. Its cultivation is considered difficult. Four years ago I had fifteen plants moved to my garden, where they are now all in a thriving condition. A shallow trench was made only a little lower than the surrounding ground in which they were planted. But they had been carefully removed with a large deep sod of earth surrounding each clump, and all the little shrubby plants that were growing around them were left in the sod. They are well worth all the trouble and cost of transplanting.

Farther back in the swamp, hid away among the Cedars, is the rare, local *Helonias bullata*, growing in clumps, with broad, thick evergreen leaves from six to ten inches in length. It grows almost wholly in water, and yet it is quite easy of cultivation in any common garden soil, where it will bloom in early April.

The Pitcher-plant is here in abundance, and is handsome all winter. The edge of the swamp is bordered with a thick carpet of aromatic Wintergreen in such profusion that the berries are collected for market, mostly by foreigners, who find a ready sale for the fruit in Philadelphia and New York.

I have tarried so long amongst the evergreens in the swamp that I have left no space to tell of the evergreens in the drier and more open woodlands.

Vineland, N. J.

Mary Treat.

Enemies of the Grapevine.

AT the Conference on Grapes held by the Royal Horticultural Society in September in their gardens at Chiswick, one of the papers read by Mr. R. D. Blackmore treated on the above subject, and it may be of interest to reproduce a few of his remarks here.

The enemies of the Vine may be broadly divided into two groups—namely, those of the vegetable order, chiefly fungoid, and those of the animal, chiefly insects, while a third group that cannot be referred to either of the above may be called miscellaneous.

Fungoid diseases are numerous and difficult to define even by skilled mycologists. Gardeners, however, designate them, according to their choice of aggression, as mildew of the roots, mildew of the shoots and foliage, or of the bunch or berry. Mildew on the roots is not a very extensive malady, and appears to exist only in places where the roots have missed their proper share of moisture. Mildew on the foliage or berry, however, is always a nuisance, and unless dealt with immediately is likely to prove an extensive disorder. In the majority of cases the evil is caused by a want of genial warmth. Perhaps there has been a creeping draught or a sudden fall in the temperature, or something in the air that sends a shiver through the leaves, and then in the early morning the first symptoms of mildew are seen. It may be but a little gray breath on the under side of a young leaf, or a dull curl at the tip of the shoot, but to the eye of the experienced gardener it means the vanguard of an army of pestilence. The innumerable spores of the disease fasten onto a weak spot, and suck and grow and propagate with rapidity. These conditions must be met at once. Raise the temperature, stop every crevice of draught, and if there be no young grapes to forbid it, fill the air with a moist exhalation of sulphur and quicklime painted on the pipes. The leaves, also, when infested should be treated to a dose of sulphur, and the border where the Vine is growing syringed with a weak solution of soft soap and sulphur. But if the sensitive berries are set these strong measures must be modified and the treatment prolonged in a milder form. Mildew on the foliage is bad enough, but on the berries it is far worse, being so much less accessible. A course which has even lately been recommended, of sulphuring the bunch and then dipping it when ripe in a bucket of clean water, is a poor practice and spoils the appearance of the grapes. The proper course is to remove every diseased berry, or even the whole bunch if it can be spared, and burn it. Then soak the soil with water almost hot, close every ventilator, fill the house with warmth, and syringe the floor (if it is feared to paint the pipes) with soft soap and sulphur mixed.

Young gardeners do not seem to know or realize the danger of giving "bottom air" too soon. In the main these sudden attacks of mildew arise from chill caused by ungenial currents of air, which check rapid growth and prepare the surface

for the reception of the hovering enemy. Every grape-grower has his particular crotchet, or, as he would rather have it called, his own enlightened theory, as to culture, for it is well known that grapes are well grown under different and sometimes diametrically opposite systems. Nevertheless, a time comes when principles reassert themselves. At the present day it is almost impossible to ripen a crop of grapes out-of-doors in England, yet it used to be done forty years ago. There has been no failing in the average temperature during these years, according to meteorological reports, but the failure is due almost entirely to the fact that open-air Vines are attacked by mildew, and this has discouraged growers.

Another violent and virulent disease of a fungoid nature is known as Anthracnose or Melanitis. Mr. Berkeley, the great mycologist, believed it to be identical with the "black spot" of Australia and the "black rot" or "grape rot" of America. The symptoms vary; in some cases no blackness is apparent until the last stage of the disease. The tip of the shoot is first attacked, and the unexpanded leaves assume a dirty wash-leather color. Lower down the shoot the expanded leaves become cupped and concave underneath. The entire shoot becomes dull and loses its crispness, and, if pinched, indents without breaking. The disease at last, after descending the stem, enters the older wood and quickly destroys the vine if not checked at the outset. Those kinds with thick, tomentose leaves, such as Gros Colman, Gros Maroc and Black Alicante, are the kinds chiefly attacked by this peculiar disease, while Black Hamburg, Chasselas Musqué and others appear to be exempt from it.

The usual post-mortem remedy is to "search the roots"; but these, together with the side shoots and lower leaves, are always healthy until the disease reaches them. To thwart the disease Mr. Blackmore tried sulphur in every form, quassia, tobacco water, etc., but one day, seeing by chance a can of strong liquid manure, he plunged a shoot into it; this treatment caused a speedy arrest of the evil, and, after two or three more dippings, a renewal of sound growth.

Among the insect pests which attack the roots or stems of the Vine comes first and most fatal of all, the Phylloxera; happily, however (owing, perhaps, to climate), English gardeners do not make its acquaintance. Then the larvæ of the cockchafer, Cetonia and other beetles, weevils, wireworms, etc. The grub of the cockchafer, though destructive, does little harm now, because it is not in sufficient numbers. The Cetonia is rare and does little injury. But the weevil (*Curculio vitis*), both male and female, is a great pest. It tears the leaves, nips off the young shoots, and in the case of pot-vines, honeycombs the soil, filling the cells with fat, curled larvæ, which in a young state are bluish white, passing into yellow when fully grown, and assuming a dirty red color in the pupa state. The presence of this insect in a pot is revealed by the leaves turning yellow, the young bunches of grapes flag, and unless strong measures are soon applied the plant eventually dies. Prevention is the proper remedy. The soil should be searched for the weevils, but it is often difficult to find them, as they resemble it in color. A good method of catching them is by ordinary Maidenhair Ferns, which act as traps. The weevils like them and get into the crowns to rest, and if a plant is turned upside down and shaken over a piece of white paper every morning the weevils will drop out should any be present. Decayed potatoes, apples, carrots and the like may also be used as traps for these depredators with advantage.

The enemies which attack the shoots and foliage are red spider (*Tetranychus telarius*) and thrips (*Thrips minutissima*). The latter is rarer than the former, and its presence is often due to the introduction of such plants as Azaleas, Abutilons, etc., into the vinery. When once established it is difficult to get rid of, and its ravages must be combatted by much sponging with soft soap and tobacco. The mealy-bug (*Dactylopius adonidum*) if once established becomes a frightful pest. It is often imported in spring by ants, and unless seen to then the gardener will have to cope with a mass of woolly filth later on. The vine scale is another enemy, but a brush filled with strong insecticide will soon dispatch it.

Among miscellaneous enemies of the Vine are scorching, sunstroke, spot upon the berries, cracking, rust, and worst of all, "shanking." The latter, especially, which some consider to be due to a local disease of the foot-stalk and others to the lack of nourishment, seems at present to be a malady little understood.

It may be mentioned that Mr. Blackmore is the author of the popular novel, "Lorna Doone," and his lecture, of which the above is a mere outline, will appear in full in the Journal of the Royal Horticultural Society and will amply repay the reading.

London.

Phono.

The Black Peach Aphid.

FOR many years Peach-trees in New Jersey, especially those in the sandy districts, have been in an unhealthy, thriftless condition. "They are badly dwarfed, and make only a feeble, sickly growth. The leaves are light green or yellowish, more or less rolled at the margins, and red or purple spotted from the attacks of Fungi." The trouble is not caused by the yellows, nor does it seem to be due to a particular fungoid disease. Fertilizers have been used to stimulate the trees, and kainit of potash has gradually come to be looked upon as a specific. This substance is undoubtedly a valuable stimulant and fertilizer, but it has another quality, to which, in the light of recent developments, most of its success is probably due. It is an insecticide of no mean value, and to this quality it owes the specific effect in a majority of cases. Dr. E. F. Smith, who has for many years studied the diseases of the Peach, has found that a plant-louse attacks the roots of the trees, and so devitalizes them as to check growth and give the well known yellow appearance.

This aphid (*Aphis Persicae niger*, E. F. Smith) was very abundant in New Jersey during the season of 1890, not only on the roots, but on the leaves. During the month of May, at Vineland, the young shoots of several Peach-trees were attacked so that they were curled and dwarfed and all but destroyed. There was a similar experience in other

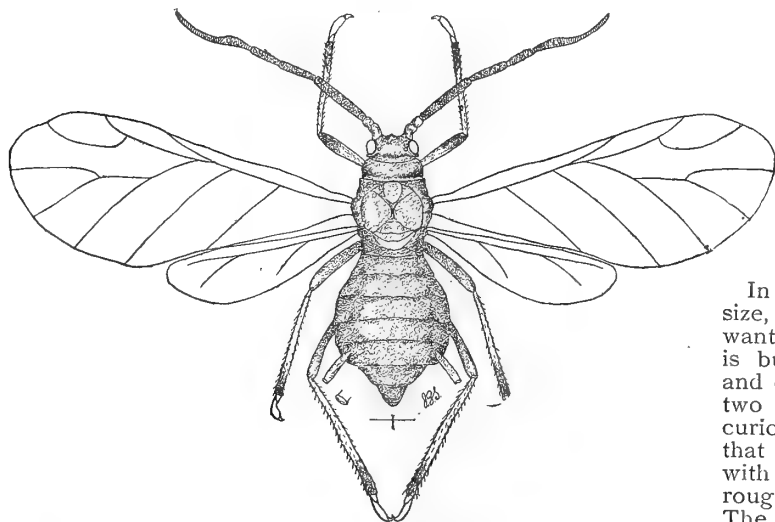


Fig. 70.—PEACH APHID (*Aphis Persicae niger*); WINGED VIVIPAROUS FEMALE.

localities. The forms of this insect seen on the leaves and branches are principally wingless, viviparous females, deep black and shining, smooth, with a well marked margin or series of lateral depressions on the abdomen. The young are paler, more brown in color, and sometimes with a green shade in newly born individuals. Among these are found a few winged forms, of which the annexed figure gives a fair idea.

They are of the same shining black color as are the wingless forms, but the body is not so stout and the antennae are longer. It is by these winged forms that the species is distributed. They fly to neighboring orchards, especially favoring young or nursery trees, and plant colonies which rapidly increase; and about midsummer make their way into the ground. At this time the leaves are comparatively deserted, but the roots are swarming with wingless forms. Nursery-trees now begin to sicken, and many die off. Dr. Smith mentions several cases of thousands of trees entirely killed, while one instance at least has come under my own notice in which the seedlings were rapidly succumbing to the attacks of this insect. Other failures reported to me are almost certainly referable to the same cause. On the root system the development continues, only wingless forms being produced, and this goes on until winter. In the mild winter of 1889-90 they continued nearly through the season. In the spring they come to the surface, and the life cycle begins afresh. There seems no place in this existence for the egg state, and true, sexed individuals are not known. There seems to be a continuous, agamic reproduction.

In general appearance this Peach-louse is very like the species infesting the Cherry (*Myzus cerasi*, Fabr.); but there are

some curious differences. The antennae in many of the plant-lice are furnished with sensory organs, the exact use of which is still unknown. In this species these sensory pits are most remarkably developed; not only are they very numerous, but they are on every joint, and are also very large. The figure brings out the structure fairly well.

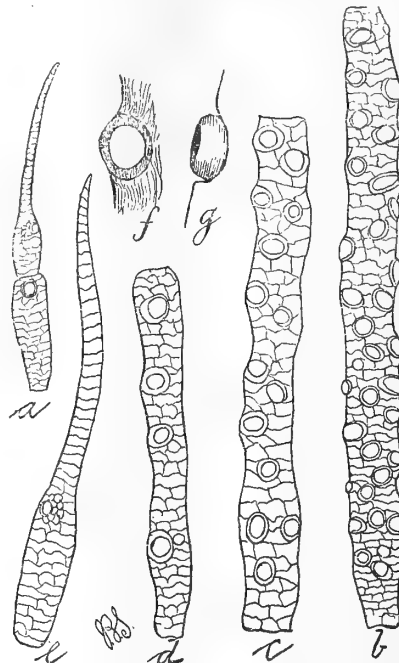


Fig. 71.—ANTENNAL JOINTS OF PEACH APHID.

a, antenna of young louse; b, first long joint of winged form; c, second long joint; d, third long joint; e, whip joint; f, sensory pit from top; g, same from side.

In the Cherry-louse these sensory pits, though still of good size, are very much reduced in number, and they are entirely wanting on the second long joint. On the third joint there is but a single pit near the tip, and only on the whip joint are the two species at all alike. Another curious fact in these antennae is, that the joints are imbricated, or with scale-like markings, as rather roughly indicated in the figures. The injury is done by sucking the sap of the tree and thus diverting the nourishment.

While the insects are above ground they are quite readily dealt with. The ordinary whale-oil soap—Leggett's Anchor Brand—is as good a remedy as any; it should be used at the rate of one pound in six gallons of water; this will kill the lice without injury to the foliage.

This insect in its underground state is the most destructive and the most difficult to deal with, as it cannot be treated with insecticides. The kerosene oil emulsion might reach it, but it would have to be very thoroughly applied. We have a much better remedy in the potash salts, and of these the kainit is best, perhaps because it contains more salt than the muriate. This has the advantage of being stimulant as well as insecticide, and the entire cost of the application is retained in the vigor of the tree. The insecticide is therefore "thrown in," for only the fertilizer is paid for. The salts should be scattered broadcast, in good fertilizing quantity, and preferably before a rain, so that the salt water may reach the roots in the quickest possible time. Never hill up the trees with potash. The chances are that by doing so you will kill the trees as well as the insects.

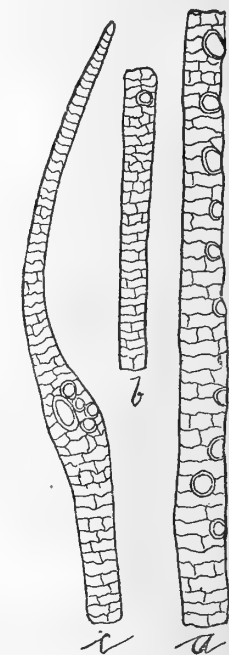


Fig. 72.—ANTENNAL JOINTS OF CHERRY APHID. (*Myzus cerasi*, Fabr.)

a, first long joint; b, third long joint; c, whip joint; all of the winged viviparous female.

Plant Notes.

Some Recent Portraits.

HÆMANTHUS LINDENI, a beautiful new plant discovered by Mr. Auguste Linden somewhere in the Congo region, which has recently flowered for the first time in cultivation in the nurseries of L'Horticulture Internationale, Brussels, is figured in the issue of *The Gardeners' Chronicle* of October 18th. Mr. N. E. Brown, who describes it, finds that the plant remains a considerable time in flower, the head being very large, and producing a hundred or more large and brilliantly colored flowers, which open in succession. He kept the specimen which Mr. Linden sent him in water for nearly two weeks, during which time the flowers continued to expand. "This species does not form a true bulb, but has a thick, solid root-stock, from which arise six or eight leaves in two ranks that persist for a long time, the plant being practically evergreen." The scape arises from the side of the leaves, is moderately stout and about eighteen inches high. The umbel of flowers is six or eight inches in diameter, with a hundred or more flowers opening in succession. The individual flowers are two inches in diameter, with a tube nearly an inch long, and long, slender lobes, which are bright salmon-scarlet color, fading to pink. The long filaments are nearly of the same color as the perianth, although whitish at the base and furnished with purple anthers. Specifically, Mr. Brown points out, this species is most nearly allied to *H. Angolensis*, but the flowers are much larger and the leaves are dissimilar.

PÆONIA MOUTAN.—There is in *The Garden* of London, published on the 18th of October, a beautifully colored plate of a single white Tree Pæony, a seedling raised by Messrs. Kelway & Sons, of Langport, who have been experimenting during the last twenty years in raising seedlings of these plants. The seed ripens in September and is sown as soon as gathered in frames without artificial heat. Some of the seed vegetate the following year, and the seedlings are allowed to remain in the seed-bed for two years. The Langport system is to plant the seedlings in the month of October, in well enriched soil, in drills two feet apart and six inches between each plant in the drills. Here they remain for two years more, and are then finally planted three feet apart each way to bloom. The best seedlings are selected for stock and propagated after grafting in the following manner: "First procure a sufficient quantity of tubers of *P. Sinensis*; cut these into lengths of about six inches; then take grafts from the sorts you wish to increase and insert these into the upper end of the tuber in the ordinary way of cleft-grafting, tie securely and cover the junction with grafting wax so as to exclude the air. These should now be potted into five-inch pots, using a good rich compost; the pots should be plunged into frames unheated; give a good watering, and cover the frames with a thin mat to partially exclude light. In the winter they should have an extra mat to protect them from severe frost. The best time to perform this operation is in the months of August and September." To show the value of these plants as ornaments for the garden it is only necessary to refer to a specimen which a correspondent of *The Garden* describes as eight feet high and twelve yards in circumference. This wonderful plant had never failed during a quarter of a century to produce annually several hundred blooms. Tree Pæonies, which start to grow early in the spring, and are, therefore, liable to suffer wherever late spring frosts occur, really do much better in this country than they do in England, and it is surprising that their value is not more generally appreciated and that they are not more frequently planted. The single-flowered varieties especially are rarely seen, although they are more beautiful and desirable than those with double flowers. There are probably still many very fine varieties to be found in Japanese gardens which have not yet reached this country or Europe.

A FRUITING GINKGO.—The Japanese Ginkgo-tree has probably rarely fruited in this country. The tree is not fruitful until it attains a considerable age, and, as the sexes are separated on different individuals, it is essential that male and female trees should grow together in order to secure fertilization; and as it is impossible to distinguish the sexes until the trees flower, the securing of both in the same plantation is a matter of mere chance. A tree planted in the grounds of the Military Academy of Kentucky produced fruit several years ago, and one of the trees in Central Park in this city is now fruitful. Miss Graceanna Lewis, of Media, Pennsylvania, sends us an admirable drawing of the Ginkgo-fruit produced by a tree in the garden of Charles J. Wistar, Esq., at Germantown, Pennsylvania, now about forty years old. This tree bore a

few fruits last year for the first time. The fruit of the Ginkgo, which few people who are not botanists realize is a conifer, is drupe-like, with a large, hard nut surrounded by thick oily flesh which soon becomes rancid and is very disagreeable. The kernel of the nut, however, has a delicate almond-like flavor much liked by the Japanese, who use great quantities of these seeds as dessert fruit.

Foreign Correspondence.

London Letter.

AUTUMN COLORS.—The weather here for the last six weeks has been remarkable for the absence of rain and an unusual amount of sunshine. The effect is seen in the bedding-plants and others placed out-of-doors for summer effect, which are now at least as good as they have been at any time during the year. Planting is delayed because of the dryness of the ground; indeed, the leaves of deciduous trees and shrubs are only now assuming their autumn colors. The conditions above named, coupled with a few slight frosts, have been favorable to the development of color in the leaves of most trees and shrubs. The Oaks, Beeches, Chestnuts, Maples, Liquidambars and Poplars among trees, and the Spiræas, Sumachs, Azaleas, Vines, etc., among shrubs, are especially rich in the glow of their golden, crimson, chocolate and scarlet hues. The Tupelos, *Nyssa multiflora* and *N. sylvatica*, are like flaming fires in color. Amongst the Sumachs the most noteworthy, on account of its beauty as much as its rarity, is *R. cotinoides*, for which Kew is indebted to Harvard. It forms a compact mass two yards through, and its leaves are now wholly rich orange in color. Apparently this species is quite at home in an ordinary border at Kew. We have not yet learned to make as much use in gardens of these autumn glowing leaves as we might. One frequently notices beautiful effects, which are the results of accident rather than design, in plantations and even in forests. These if reproduced in the garden would be delightful. We want some one to set down for us the names of the plants to use for autumn effects, such as those described, and the positions they thrive best in. Mr. Jack and other correspondents did something toward this last year in GARDEN AND FOREST. The brilliancy of color in many of these leaves in autumn is quite equal in effect to anything produced by flowers, and in a favorable season the leaves remain in beauty at least as long as flowers. And yet I think I am right in saying that in most gardens the usefulness of autumn-tinted trees and shrubs for producing a picturesque effect is either unknown or ignored. The Azalea-garden at Kew now is as charming in the varied hues of the leaves as it was when the flowers were the attraction. This is equally true of the shrubby Spiræas and of many other *Rosaceæ*. The Sumachs are almost singular in owing their favor in most gardens to the brilliant colors assumed by the leaves in autumn.

The Sea Buckthorn (*Hypophae rhamnoides*) by the side of the lake at Kew is as heavily laden with bright orange berries as the best fruited *Pyracantha* I ever saw. Is it known as a fine shrub in your gardens? Of course a male plant must be planted near the females to get fruits.

ORCHIDS.—*Cattleya Bowringiana* is a very useful plant, as it flowers late in the autumn when there are comparatively few Orchids in bloom. Its colors are warm and attractive, the flowers are elegant, and they last well. It may be called an autumn-flowering *C. Skinneri*. Another species of *Cattleya* which is flowering now is *C. maxima*. There are varieties of this so poor as to be scarcely worth growing; but in the variety named *Peruviensis* we have a first-rate plant, very free in the production of flowers, whilst the colors are brighter and the size almost twice as large as in the ordinary forms.

C. du Buyssoniana is a new species, of which plants in flower were recently exhibited in London by M. Linden's Company, of Brussels. It may be called a variety of *C. amethystoglossa*, with sepals and petals cream-yellow and a rich mauve labellum. The same company exhibited a plant in flower of a magnificent variety of *C. aurea* named *Lindenii*. The sepals and petals were of a clear lemon-yellow color, not buff, as is usual in this *Cattleya*, whilst the lip was enormous in size and heavily penciled with golden yellow. A series of varieties of this newly introduced *Cattleya* were exhibited under the name of *C. Warocqueana*, but which has been described by Mr. Rolfe as a variety of *C. labiata*. It appears to be about midway between the sub-species *C. Trianae* and *C. gigas*, and is really distinct, large flowered, handsome and apparently easily cultivated. Some of the flowers exhibited measured seven inches across, the sepals and petals were of good substance and two and a half

inches across, whilst the lip was funnel-shaped, nearly four inches long, with a wide spreading undulated limb. The colors ranged in the different varieties from rich rosy mauve to pure white, the labellum being more or less deep maroon and yellow. Their varietal names were *Regalis*, *Amethystina*, *Delicata* and *Flammea*. There are many beautiful forms of *C. aurea*, but the rarest and most delightful of all is that named *Imshottiana*, of which Baron Schroeder exhibited a plant in flower last week. It has milk-white sepals and petals and a labellum colored as in the type. A specimen of *Cypripedium Fairreanum*, bearing seven elegant flowers, was shown from the Baron's collection, the richness of which is often

little account as a garden Orchid; *Lælia Arnoldiana*, very similar to, if not the same as *L. Crawshayana*, and *Catasetum Bungeothii*, var. *Randii*, remarkable in having cream-yellow flowers instead of white, as in the type. These were the most striking of the Orchids exhibited at the last meeting of the Royal Horticultural Society.

Ærides Lawrencei is the largest flowered, and, at the same time, one of the most beautiful species known. It has lately become plentiful owing to a large importation of it by Mr. Sander, and its flowers are not now uncommon in collections. But in 1883, when first introduced, a single example was purchased by Sir Trevor Lawrence for 235 guineas. A plant of it



Fig. 73.—*Celastrus articulata*.—See page 551.

abundantly manifested at the meetings of the Royal Horticultural Society, in which the Baron takes such an active interest. Besides the above he also sent several plants in flower of his magnificent variety of *Dendrobium Phalanopsis*. Some of the flower-scapes were twenty-one inches long, and bore each six or seven flowers, which were three and a half inches across, and colored a rich rosy mauve, almost crimson, the color of the curiously formed labellum being a deep velvety maroon. Although introduced ten years ago from north Australia, yet this species is extremely rare in cultivation. I am informed, however, that the Linden Company, at Brussels, have lately imported about 2,000 strong plants of it. *Lælia grandis vera*, a fine form, with broad nankeen-colored sepals and petals and a rose-purple labellum blotched with maroon; *Aganisia cœrulea*, a rare plant of some interest on account of its peculiarly formed and uncommon colored flowers, otherwise of

now flowering at Kew was obtained several years ago for *A. Sanderianum*. It is related to *A. odoratum*, indeed probably only a variety of it, but the flowers are one and a half inches across and fully as long, and they are white, with magenta tips to the segments. *A. Sanderianum* is almost as large, but it differs in the form and color of the labellum. We are as yet ignorant of the habitat of these two noble *Ærides*, but it is probable that they occur together.

Pleiones are the gayest Orchids in flower now at Kew. Some of the pans in which they are grown are only ten inches across, yet I counted seventy-five flowers on one panful a few days ago. When understood, Pleiones are very easily cultivated. They require a rich soil, chiefly turfy loam and leaf-mould, no water after potting until they have pushed their new roots well into the soil, and then plenty until they lose their leaves again. A position near the glass in a sunny, airy greenhouse suits all

of them except *P. præcox*, which thrives best when grown in a warm house. When the flowers are opening the soil should be at once saturated and afterward kept just moist. Many people err with these plants by trying to grow them in a high temperature and by failing to give them a rest in a dry, sunny house from the time when the leaves fade until the flowers open.

Renanthera coccinea, the Chinese Air-plant, is one of the most gorgeous Orchids, but it requires a considerable amount of head room to persuade it to flower. In tropical countries it is a favorite plant for verandas or to grow in masses in sunny positions. The stems grow almost as long as the Vanilla, and the stronger and longer the stems the larger the inflorescence will be. About six years ago a few newly imported small pieces of this *Renanthera* were fastened to a dead Fern-trunk, which was placed in a sunny position in the Palm-house at Kew. One of these pieces is now nine feet long, and it bears a raceme of about sixty large, rich orange-crimson flowers. Compared with what is produced by well cared for plants in the tropics this is small, still the flowering of this plant in glass houses is of rare occurrence. By training the stems horizontally it is possible that they may be induced to flower even in small houses. The plant revels in sunshine and moisture.

Kew.

W. Watson.

New or Little Known Plants.

Celastrus articulata.

ALTHOUGH discovered by Thunberg and first published more than a century ago, no figure, it seems, has appeared before of this handsome Asiatic species, which possesses very considerable value as a garden plant.

Celastrus articulata,* in cultivation, is a stout, rapid-growing and very vigorous, leafy plant, with twining stems, growing to a height of ten or fifteen feet. The bark is light brown or ashy gray, and is conspicuously marked with numerous small, pale, wart-like excrescences. The leaf is obovate, orbicular or oval, coarsely crenulate-serrate, contracted at the apex into a short, broad point, and at the base into a long, broad petiole. It is membranaceous, with a prominent midrib and primary veins and rather conspicuous reticulated veinlets, and is often, when fully grown, four or five inches long and two and a half to three inches broad. It is dark yellow-green on the upper, and paler on the lower surface. The small yellow-green flowers are produced in short axillary three-flowered clusters less than half the length of the petioles, and appear when the leaves are rather more than half grown. The fruit is globose or sometimes obovate, and pale green when it first ripens. Later and after opening, the pod turns bright, clear yellow, making a handsome contrast with the brilliant orange-colored aril of the seed. It is produced in great profusion often on short, spur-like, lateral branches, and does not disappear until late in the autumn or until long after the falling of the leaves, which, as long as they remain on the plants, nearly hide it from view.

Celastrus articulata is apparently widely distributed through northern and central China and through the northern parts of Japan. It shows, however, considerable variation in the form of the leaves, specimens collected by Dr. Henry (Nos. 5640 and 5986) in western China, and referred to this species by Professor Oliver, having ovate-acuminate leaves, slightly and remotely serrate only.

Celastrus articulata has been cultivated for several years in the Arnold Arboretum, where it was first sent by Mr. S. B. Parsons, of Flushing, New York, in 1879. It has also been raised here from seed collected by Dr. Bretschneider in the neighborhood of Pekin. It is perfectly hardy, and grows with the greatest rapidity and vigor, and has been found useful in covering rocks, walls and waste places; and late in the year, after the leaves have fallen, it is exceedingly ornamental.

**Celastrus articulata*, Thunberg, "Fl. Jap.," 97.—Bunge, "Enum. Pl. Chin. Bor.," 97.—Maximowicz, "Mél. Biol.," xi., 202.—Franchet, "Pl. David.," 70.—Forbes & Hemsley, *Jour. Linn. Soc.*, xxiii., 122.

Articulata, the specific name in the "Flora," is, as Maximowicz has pointed out, a misprint for *orbiculata*, the name used by Thunberg in his preliminary catalogue of Japanese plants *l. c.* xlii.

Although much more vigorous, and a larger and more rapidly growing plant, it is less beautiful than the North American species, *Celastrus scandens*, the Climbing Bitter-Sweet or Roxbury Waxwork, in which the flowers are not axillary, but are produced in long, raceme-like clusters, terminating the branches, so that the fruit is raised above the leaves, and is a conspicuous and handsome object all through the early autumn, when that of the Asiatic species is hardly noticeable. The fruit of the American species is moreover rather larger and more brilliantly colored.

The figure on page 550 is from a drawing made by Mr. Faxon from one of the plants growing in the Arboretum.

C. S. S.

Cultural Department.

Late Irish Potatoes in the South.

THE late fall crop of Irish potatoes in the south is annually becoming a more important matter as its proper treatment is better understood and the conditions for success are known.

Formerly, this late crop of Irish potatoes was the most uncertain of all, now it is as certain as any. Just at this date (October 25th), when northern Irish potatoes are retailing in Raleigh for sixty cents per peck, the outcome of the late planting is specially important. Experience has demonstrated that in this latitude the best time to plant this crop is about August 15th. In late autumns they may mature planted later, but this is about the most certain period. The practice of our best growers is to bed the small potatoes from the early crop as soon as dug in a single layer, so they do not just touch each other, cover with an inch or so of soil, and leave them until planting time. By mid-August all the immature tubers will either have rotted or dried up and the good ones will have begun to sprout. These are then planted in well prepared land, and only covered with about one inch of soil, which is rolled compactly. This shallow covering is one of the most important points, as it is found that if covered deeply they will not grow so rapidly. The crop planted August 15th will be matured by October 31st or a little later. Last fall (1889) was unusually late, and potatoes planted the second week in September made a good crop, the tops not being killed by frost until November 28th; but in an ordinary autumn it is desirable to be ready for killing frost early in November.

This late crop in this latitude can be left where they grow and covered with straw to prevent freezing. They can then be dug at any time in winter and will sell as new potatoes at a good round price. One grower in this state sold his entire crop last winter at the same price as new Bermudas, and made a very good thing of it. But the great advantage of this late-fall crop of potatoes is that they keep unsprouted all winter and late into spring, and will easily take the place of northern-grown old potatoes in spring when their quality is better known. The ease and certainty with which this crop is now grown will be a great inducement to southern farmers to extend the cultivation of late potatoes.

Raleigh, N. C.

W. F. Massey.

The Rot Among Late Potatoes.

MANY specimens of rotting Irish potatoes have been received at the Agricultural Experiment Station within a week. A large number of the Potato-growers of Salem and Cumberland Counties, of this state, will lose their entire crop. In a recent visit to the regions most affected I have seen many fields that would have yielded 100 bushels per acre abandoned as not worth the cost of harvesting. The rot has been unusually serious in southern New Jersey. One cause, unmistakably, has been the protracted rains. The *Phytophthora infestans* thrives in moist weather; and while it appears more or less every season, it is only found in low places in dry seasons, although abundant enough to furnish a constant supply of spores for future outbreaks when weather favorable to it occurs. The Fungus first attacks the leaves and afterward works its way down the juicy stems into the tubers. Mildew may reach the potatoes by the spores on fallen leaves being washed into the soil by rains. This Fungus grows with surprising rapidity. A decayed potato, brought from near Bridgeton, was cut into halves this morning at eight o'clock, and each piece placed under a bell-jar standing upon a plate holding water to produce a moist chamber. At twelve o'clock spots of white mould were visible upon the cut surface, and, when subjected to microscopic

examination, were found to consist of numerous filaments of the Rot-fungus, many of which were bearing a half dozen spores, some apparently of full size. In four hours, therefore, the filaments within the potato had grown from the cut surface and "fruited," as the term is used by mycologists. This experiment indicates how rapidly the Rot-fungus may spread in a Potato-field.

It is a well known fact that the Potato-rot Fungus, as a rule, does not do its greatest damage until midsummer, and often not until late in September, as in the present instance. It is an advantage, therefore, all other things being considered, to plant early and to have the crops harvested before the decay becomes serious. Some of the people in southern New Jersey planted late to escape the Potato-beetles. There may be other advantages, in a good year, in having the crop late, as the labor is better distributed and the yield is larger; but in a wet season it is fatal. Aside from early planting, something can be done to check the Rot-fungus by spraying the vines. Experiments have proved that compounds of copper, as the Bordeaux mixture and others, are effective for Potato-rot. The fungicide may be mixed with water containing London-purple used for the beetles, and applied at the same time. A few sprayings in an ordinary year may save the foliage.

Rutgers College.

Byron D. Halsted.

Late-Flowering Asters.

A. SHORTII.—This desirable plant is from four to five feet high, and it bears in great profusion flowers about an inch across, with pale lilac-blue ray-florets. The blooming season extends from the middle of October till the middle of November. It is found from Ohio to Georgia, westward to Illinois and Kentucky. Holding its flowers undamaged later than any other native Aster, the scarcity of other flowers and the forlorn nature of its surroundings render its aspect and utility more striking than would be the case earlier in the season. Rich garden soil, a position sheltered from strong winds and partially shaded from noonday sun are the conditions most favorable to the development of its best qualities. In an exposed sunny position or in light soil the growth of the plant is less vigorous, and, while it blooms earlier under such circumstances, the fewer flowers of indifferent quality pass away before those on plants in the right situation begin to unfold.

A. TARTARICUS.—This species comes from Tartary, having been introduced in 1818. In general appearance it differs widely from the ordinary species of this country. The thick, somewhat succulent stem is boldly erect, its surface prominently furrowed, and is generally more than six feet high. This plant has three distinct series of leaves. They are all oblanceolate and of a rather pale green color. Those of the radical series are fully two feet in length, crenate and converging at the base to a long petiole. The much smaller leaves of the stem are sessile and conspicuously serrate, and those of the branches still smaller, sessile and minutely serrate. The racemose-paniculate heads are few-flowered, the flowers, however, being an inch in diameter, with showy rays of deep reddish lilac. The plant is valuable chiefly on account of its late-flowering character, the flowers developing during the latter part of October and early in November. Half of the flowers still remain unopened. This plant is found useful here for cutting from, but in the warmer climate of states farther south it should prove still more valuable. A rather poor soil and a situation well exposed to sunshine are required to induce the plant to flower in this locality before severe frost renders it impossible.

A. TURBINELLUS.—This is without doubt the best of the late-flowering kinds. It is native in Illinois, Missouri and Louisiana. The stems attain a height of from three to four feet, and push branches from the axil of almost every leaf. The leaves are comparatively small, dark green, lanceolate and sessile. The flowers are about one and a half inches across, with ray florets of a showy blue tint, reflexed at the tip. The instances of more than one flower developing upon the same branchlet are exceptional, though one may occasionally find as many as three. The free-branching habit of the plant, however, ensures a bountiful supply of flowers. Strong clumps make an excellent display in the herbaceous border during the early part of October. The stems, of course, require staking, but if all the branches are left to assume their naturally pendulous habit the gracefulness of the mass will be materially enhanced. The time at which this Aster blooms renders it most useful for cutting, and space should be found for a few clumps of it for that reason. It is found at its best in a sheltered, sunny position in moderately rich soil. I am told that *A. laevis* is sometimes substituted for this species by

dealers. *A. laevis* is a worthy enough subject in its place; but it is a less elegant plant with much coarser leaves, and its smaller blue flowers are past when those of *A. turbinellus* commence to expand. Purchasers, therefore, should be careful as to the reliability of the dealer with whom their orders are placed.

Cambridge Botanical Gardens.

M. Barker.

Brunfelsias.

BRUNFELSIA (*Franciscea*) are handsome Brazilian shrubs, several species of which have long been in cultivation, though comparatively rare in American collections. These plants need a warm-house, and do not thrive if given too much sun. Full exposure to the light and heat during the summer is not best for them, and though they enjoy liberal watering and syringing when in active growth, discretion should be used or the plants may become sodden and thus lose their roots. When this occurs it becomes rather a tedious operation to restore the plant to health. As to soil, Brunfelsias prefer a light peaty mixture, rather coarse and fibrous, and with good drainage; some lumps of charcoal are a useful addition. The propagation of the Brunfelsias is effected by means of cuttings made of the young growth; these root readily when kept rather close and subjected to a moderate bottom heat. The young plants grow quite rapidly in a temperature of sixty to sixty-five degrees, and the shoots should be pinched occasionally to encourage a bushy habit.

Old established plants will bear severe cutting back to keep them compact in form, as when they are allowed to take their own way they are apt to become rather straggling in appearance.

Regarding varieties it may be stated that *B. calycina* and *B. calycina major* are among the most showy. *B. calycina major* is a garden variety of *B. calycina*, and is quite similar in general appearance to the type, but rather stronger in growth. It bears larger flowers, which are often four inches in diameter, a deep purple color when first open, but fading several shades lighter as the flower ages. The leaves are lanceolate, from four to six inches long and bright shining green.

B. eximia is another fine species, and produces flowers about two inches in diameter and violet in color. The foliage of this species is not so large as that of the preceding, nor so bright, being dull dark green. *B. eximia* is not difficult to manage and continues in flower for a long time, and for this deserves special mention.

A much smaller variety than either of the preceding is *B. uniflora*, which is more useful when small than the stronger growers, from the fact that it makes a compact little plant and is almost continuously in bloom. The flowers are comparatively small, and about the color of a Neapolitan Violet at first, but gradually fade to white, the different colors of the flowers on the same plant having rather an odd effect. This plant is also of some repute in Brazil as a remedy for certain diseases, the roots, and in some instances the leaves also, being used as a medicine, and for this reason it is there known as "Vegetable Mercury."

B. Lindeniana is also worthy of cultivation, and has somewhat similar characteristics to *B. uniflora*, but is larger and stronger. Its flowers are bright purple, with a light centre, and very showy, and the leaves are of medium size, dark green and rather pubescent.

There are several other species which produce quite showy flowers, but those I have mentioned are most easily procured.

Holmesburg, Pa.

W. H. Taplin.

Enemies of Chrysanthemums.

WHILE most of our Chrysanthemums are good, and a few exceptionally so, it is evident that they would have been much better, but for various diseases from which they have suffered. It cannot be true that failure, so frequently reported, is generally the result of carelessness. A good rich soil, when pot-grown, moderately rich when planted out; plenty of water; careful attention with regard to stopping growths, so as to obtain bushy plants; disbudding, to obtain good-sized flowers well distributed over the specimens. These seem to be necessities in cultivation.

The various insects which abstract the juices by means of a beak or proboscis, such as are commonly called chinch bugs, have been numerous as well as various. They appear to have been quite local in their ravages. As was stated by Mr. Jack in a recent number of GARDEN AND FOREST, no external application is of any use in overcoming them except temporarily.

Insects common here could hardly be found in a collection two miles away, where another prevailed which gave us no

trouble. Forty miles away an entirely different insect from either gave the most trouble.

Apart from diseased conditions, which are clearly caused by insects, there are some which are not so easily explained. A number of plants, some of which are now among the best, lost color, that is, went pale, the change being discernible in twenty-four hours. They regained color after two or three weeks without loss of foliage. I consulted several growers, and every one informed me that my plants were either too wet or too dry. I can only say the drainage was good in all cases. I read with interest Mr. Halsted's notes on the Nematodes in No. 138 of GARDEN AND FOREST, and according to his description I am inclined to think some of our plants have the disease caused by them, although I must say that most of the unhealthy plants are those which have been so for two or three seasons. Being good varieties, and some old ones, I have hesitated to throw them away, hoping to bring them into a healthy condition by careful treatment the whole year round. Good healthy-looking cuttings were put in with the others and flourished. All went well until the middle of June, when a few leaves began to wither on one side or at the tip of the leaf, while the base generally remained green and fresh. The affected portion would pass through all the stages of decay, and even after it had dried up the unaffected part would yet be green. A curious thing about this disease is that when once it appears it remains on that particular plant the whole season, and in every case they are old varieties which have exhibited the same disease before. Monsieur Raoux, Daimio, Roseum superbum, Alfred Salter and Talfourd Salter are the greatest sufferers, but neither Jardin des Plantes nor Mrs. George Rundle have done well.

Quite a number of plants have been attacked with a blue aphid on the roots, apparently the variety so destructive among China Asters near Boston last summer. The presence of ants always indicated affected plants. Soot, guano, lime-water (even to soaking the plants in it), sulphide of potassium and magnesium oxide were used against them. The latter compound usually drove the ants away for a day or two, but, likely, only to carry their stock of aphides to another plant, or, perhaps, return. I had an idea that if ants could be banished, successive waterings would fill up the air holes, which they constantly kept open, and so smother the aphides. There is also a roundish, white insect larger than the ordinary aphid, and not unlike what is known as "mealy bug." It is the ants' "cow." I notice now, October, they are busy carrying dead ones to the surface. I have used no insecticides, and do not know whether they have died a natural death or not.

I write of these troubles now in the hope that other growers will give an account of their experience, and perhaps suggest effective methods of treatment against the enemies which seem to attack the Chrysanthemum in increasing numbers every year.

Wellesley, Mass.

T. D. Hatfield.

Ornamental Trees and Shrubs.

ROBINIA PSEUDACACIA, VAR. MIMOSÆFOLIA.—The foliage of this form of our native Locust is of an extremely light and graceful appearance, on account of the small size of the leaflets and their dark and rich shade of green. One would hardly imagine it to be a form of our Robinia at all at first sight. It is most striking in a certain airy character of its foliage, and must make an elegant specimen for a lawn.

ULMUS SINENSIS is a rare Elm, which makes a dense head composed of fine branches and twigs, with its deep green, glossy, acuminate leaves of only two inches in length by three-fifths of an inch in width, closely imbricated or overlapped, in one plane, on the new shoots. It is a tree of very remarkable beauty of foliage, and of as great beauty of outline of the head, when developed. There seem to be several varieties of this or closely related species lately introduced into cultivation, but the form here noted, with foliage lying in one plane on each new shoot, is very distinct and desirable.

A **WEeping PURPLE BEECH**, lately introduced, is proving to be a really desirable tree. Its color is all that can be desired in a Purple Beech, and its pendulous habit is, apparently, an improvement upon that of the well known Weeping European Beech, on account of its regular, upright growth of stem. The irregular form of the old sort is, of course, one of its attractions, but the erect growth of the new variety is in its favor, at least in the practical business of propagating it in the nursery, where the old sort was very unsatisfactory. The side branches have a sweeping and regular "weeping" habit possessed by no other tree.

PTELIA TRIFOLIATA, VAR. AUREA, came out a few years ago, and we have been able to study it under all the conditions of propagation and growth for three years, and it is certainly one of the most richly colored of all the trees and shrubs, having yellow foliage, and keeps its foliage and its high color until into November. Its growth is that of a large shrub, and it can also be grown as a small tree. There is a gloss to the surface of the foliage of the Ptelia, and this serves to bring out the color of this new "golden" sort as varnish brings out the color of painted surfaces, thus greatly enhancing its effectiveness. The yellow or Golden Elder is, by many, considered the finest of that class of foliage plants; but a glance at both these kinds, growing side by side, shows this Ptelia to be very much the richer and more effective. I have never seen the latter burned by hot suns, while the former often gets scorched in midsummer. At this writing, October 9th, our Ptelias are splendid masses of color.

STYRAX OBASSIA has been perfectly hardy here at Cambridge for three years, and now appears to be perfectly contented. Its foliage is oval, or obovate, rugose, of very large size, fully seven inches long by five or six wide, of a light green color. Its blossoms have not appeared here yet, but are described by one who has seen them much in Japan as about one inch across, disposed in racemes eight inches long and very fragrant.

STYRAX JAPONICA, the other Japanese species, has, on the contrary, small and very distinct foliage, with blossoms borne singly and hanging down beneath the rather horizontal branches in the greatest profusion. Both seem to me among the best of the rarer shrubs.

Cambridge, Mass.

F. L. Temple.

Vitis heterophylla, sometimes sold as *Ampelopsis tricolor* or the Turquoise Berry, is a hardy deciduous vine from Japan which deserves a place in every garden, although it is comparatively rare in cultivation. Its habit is similar to that of the Grape, and an established plant will cover a large space with its growth in a single season. The leaves are beautifully mottled with white, while their veins and petioles are a rosy red and the laterals are of the same color. The fruit is small, and it is also variously colored, ranging from a pale China blue to peacock blue, and it makes a beautiful contrast with the variegated foliage. The variegation is more striking on vines which grow in a partially shaded position. It should be planted in a rich loam made light and porous with old mortar or sand. Very little barn-yard manure should be used. Plants trained to pillars, railings or arbors should be cut back hard in winter and tied securely, and the new growth should be allowed to hang loosely where it is not necessary to extend the area it covers; but wherever it can ramble and grow at will it makes a charming picture. This plant is used as an undergrowth in beds of sub-tropical plants in the parks about London with a pleasing effect. It is readily propagated by cuttings from the ripened wood as Grape-vines are. It can be grown also from seed, but this is a much slower process.

Dongan Hills, Staten Island.

W. T.

Correspondence.

The Hemlock in Eastern Minnesota.

To the Editor of GARDEN AND FOREST:

Sir.—In your issue for October 8th (p. 496) is a note regarding the discovery of the Hemlock in Carlton County, Minnesota, by Mr. H. B. Ayers, at a point farther west than any hitherto known. In Upham's "Catalogue of the Flora of Minnesota" the tree is doubtfully assigned to a few stations, one of which is not far from the place given by Mr. Ayers. The statement is made that they all need verification. Some of the localities are west of the one given by Mr. Ayers, but all of them are not beyond Carlton County. It may be of interest, therefore, to cite some passages from Schoolcraft's "Narrative Journal of Travels from Detroit North-west through the Great Chain of American Lakes to the Source of the Mississippi River in the year 1820" with reference to the presence of the Hemlock in this region. The expedition was under the direction of Governor Lewis Cass and passed through this part of Minnesota. In reading it, the impression is received that the Hemlock was then a common or even abundant forest-tree of the region. The narrative shows throughout that the author was a careful observer and would not easily mistake another tree for the Hemlock. These trees may have largely or wholly disappeared since that time; and if so, it would be interesting to know the causes, if discoverable, for they might have some bearing on forestry conditions and preservation.

It may be only the oft-told tale of destruction by fire and the axe, but if by the latter, the lumbermen ought to know something about it. But from the discovery of Mr. Ayers I suspect that more careful inquiry will lead to finding the tree in other localities, for I shall assume that Schoolcraft knew whereof he wrote.

The expedition went up the St. Louis River, which flows into Lake Superior at its western extremity, then called Fond du Lac Bay. From the St. Louis it crossed over to Sandy Lake, which is tributary to the Mississippi, and is situated in the county next west of Carlton. There it ascended the Mississippi as far as Cass Lake, which it took to be the source of the river. But I find no reference to the Hemlock which could be assigned to a range west of Carlton County, and have noticed none at all in Schoolcraft's account of his expedition in 1832 to Itasca Lake, which, however, is purposely abbreviated where the same ground was traversed. The first mention of the tree which can be assigned to Minnesota is during the passage of the Grand Portage of the St. Louis, the foot of which is placed in the itinerary twenty-three miles above its entrance into the bay. By a chain of rapids and falls the river makes a rapid descent of nine miles, around which boats and baggage had to be carried. Five "pauses" were made the first day of the ascent, a "pause," in the reckoning of the voyageur, averaging half a mile. The next day the party toiled on in a heavy rain, and the journal in part describes their experiences as follows: "We are advancing into a dreary region. Everything around us wears a wild and sterile aspect, and the extreme ruggedness of the country, the succession of swampy grounds and rocky precipices, the dark forest of Hemlock and Pines which overshadows the soil, and the distant roaring of the river, would render it a gloomy and dismal scene without the toil of transporting baggage and the saddening influence of one of the most dreary days" (p. 206). In the journal for the following day (July 8th), on which they halted, Schoolcraft gives a more extended account of the objects of interest observed, quite minutely noting the more prominent geological and vegetable features, as is seen in this extract: "The growth of trees is Pine, Hemlock, Spruce, Birch, Oak and Maple, the former predominating. In clambering among the rocks along the river I found the red Raspberry ripe. This appears to be the common *Rubus strigosus* with a thornless stem; berries scarlet-red, very sweet; akenes lightly adhering. Where depressions exist in the surface of the soil, so that it remains wet and marshy, the Tamarack is found, and the White Cedar is seen overhanging the cliffs on the banks of the river, and adds very much to the picturesque appearance of the St. Louis at this place" (p. 207). From the head of the Grand Portage they go on six miles to the Portage aux Couteaux, the "Portage of Knives," so named because the outcropping edges of vertically arranged layers of slate rock cut the moccasins and feet of the voyageurs making the passage. Its extent is a mile and a half. "The growth of trees here is almost exclusively Cedar, Pine and Spruce."

The difficulties attending the further ascent of the St. Louis being great, Governor Cass sent from this point a party of sixteen, including Schoolcraft and Indian guides, to see if a shorter and more expeditious road did not exist between it and Sandy Lake. The main expedition kept on by the usual route, the exploration by the detachment being for future guidance. But the obstacles encountered seem to have been of a more serious character than those of the ordinary route. It was represented as a two days' journey, but it took the party from the morning of July 10th till noon of the 13th to reach the lake, much of the way being in a very difficult forest. In the account of the first day this description occurs: "Our guides, taking their course by the sun, immediately struck into a close, matted forest of Pine and Hemlock, through which we urged our way with some difficulty. On traveling two miles we fell into an Indian path leading in the required direction, which we followed until it became lost in swamps. After pursuing it two miles, we passed through a succession of ponds and marshes, where the mud and the water were in some places half-leg deep. These marshes continued four miles, and were succeeded by a strip of three miles of open, dry, sandy barren, covered with shrubbery, and occasionally clumps of Pitch Pines. This terminated in a thick forest of Hemlock and Spruce, of a young growth, which continued two miles, and brought us to the banks of a small lake, with clear water and a pebbly shore" (page 210). Two more small lakes were passed soon after, and going on from the last of these for eight miles through a swamp of Tamarack, called by the author *Pinus pendula*, they came to another lake, by which they encamped, the whole distance made during the day being given as twenty miles. My copy of the book is unfortunately

without the map published with it, but from a similar one given in the account of the expedition of 1832, and from the position of Knife Falls, from which they set out, this journey may reasonably be located in the northern tier of townships of Carlton County, or near by. In "Rand and McNally's Sectional Map of Minnesota" four small lakes are found not far apart in Township 49, Ranges 18 and 19, or, since the last stage of the day would indicate a lake somewhat farther off than any of these are from each other, they may have gone farther south into the next tier of townships to a lake near Kettle River.

The next day they went on for nine hours in the swamp, the distance made during the day being given as fourteen miles. It was a very fatiguing journey, under guides uncertain about the way. Schoolcraft gives the following account of some of the experiences of the day: "The dreadful storms which prevail here at certain seasons are indicated by the prostration of entire forests, and the uprooting of the firmest trees. These lie invariably pointing toward the south-east, indicating the strongest winds to prevail from the opposite point. It is one of the most fatiguing labors of the route to cross these immense windfalls. The trees are chiefly Tamarack, Spruce, Cedar, Ash, White Birch and Hemlock. In the course of the day we have crossed a turbid stream running toward the south, called Akeek Seebe (Kettle River), which is tributary to the Missisawgaiegon, which enters the Mississippi a short distance above the falls of St. Anthony, after having passed in the intermediate distance through the Great Spirit Lake" (page 214). This is in part a geographical error, as no rivers from this region go into the Mississippi except by Sandy Lake or the St. Croix. But Kettle River is tributary to the St. Croix, and it rises in the northern tier of townships of Carlton County not far west of the lakes mentioned above. This is the last mention of the Hemlock in the narrative as far as I have observed. On the 12th they went on for twelve hours in the swamp, emerging at nightfall, and encamping by a small stream called "Buffaloe Creek," tributary to Sandy Lake, which was reached the next day.

The body of the expedition continued their course up the St. Louis to the mouth of the East Savannah River, and by this and the West Savannah passed over to Sandy Lake. Schoolcraft requested Dr. Wolcott, physician of the expedition, to act as naturalist in his absence. It is not definitely stated in the short account he gave that the Hemlock continued to be found, though it may be included in the statement he makes that the banks of the river above the Portage aux Couteaux were "always covered with a thick growth of Birch, Elm, Sugar-tree (*Acer saccharinum*) and the whole tribe of Pines, with an almost impenetrable thicket of underbrush." Most of the botanical writers of the time included the Hemlock, Spruces and Firs under the genus *Pinus*.

From these extracts and statements it is safe to conclude that the Hemlock was a well known tree in this region in 1820, and that it extended, at least, well toward the western limits of the territory now included in Carlton County. And I may add that in going northward from Duluth to Two Harbors by the shore of Lake Superior, in the summer of 1889, I thought the Hemlock was one of the trees observed from the cars while passing. But in this I may have been mistaken, though I have reported the tree as present there. In a doubtful case thorough identification would demand closer inspection of a tree than can be had when the observer is in rapid motion. But as the Hemlock is reported by Agassiz among the plants of the northern shore of Lake Superior, it is not unreasonable to suppose it may be found at its western extremity. In his list of plants gathered, and given in connection with the topic headed "Observations on the Vegetation of the Northern Shores of Lake Superior" (page 165), he names no locality for the Hemlock, so that it is not easy to determine how far west it was found, the expedition having gone as far as the Victoria Islands, or nearly to the United States boundary, before turning homeward.

It might be deemed more satisfactory if Schoolcraft had somewhere given the botanical name of the Hemlock, as he does at times of other plants. But I do not find its scientific name in any of the three volumes of his explorations in this section or immediately south. But the *usus loquendi*, both in common and scientific language, at the time, is sufficient proof that the Hemlock-Spruce (*Tsuga Canadensis*, Carrière, *Pinus Canadensis*, Lin., and authors) was meant. As the equivalent of *P. Canadensis*, Hemlock, or more commonly Hemlock-Spruce, is given by the following authors about that time: Pursh (1814), Nuttall (1818), Barton (1818), Elliott (1824)—a list not intended to be exhaustive, but representative.

Englewood, Chicago.

E. J. Hill.

Periodical Literature.

WE are pleased to find in the November number of the *Century Magazine* an editorial article entitled "Forestry in America." So clear and sensible a paper would have been pertinent and welcome at any time; but it is doubly valuable now, following as it does the articles by Major Powell in the same magazine, to which we have referred as likely to exert a pernicious influence on the public mind.

It is not needful that we should quote largely from the article. It simply rehearses facts and voices sentiments with which our readers are familiar. It speaks of the non-existence as yet of any real science or practice of forestry in this country, of the need for this science and practice, of such local efforts as have been made to preserve forests and beautiful tracts of landscape, and then, at some length, of the value of the forests on our public domain to the American people at large. The suggestion made in these columns, that until some more adequate means is provided the army should be used to preserve these forests, is endorsed, and an especially good point is made in the recommendation that, among spots which should in some way be forever preserved for public use, tracts of sea-shore ought to be included. This point has hitherto, we think, been overlooked in theoretical expositions of the importance of establishing parks and reservations of different kinds; but, as the writer says, "unless there is prompt action in this direction our children will probably live to see the shore-lands everywhere enclosed, and in many places a fee demanded for a good view of the ocean, as we had to pay to see Niagara until the state of New York made that scene of beauty and grandeur a public possession and forever free to all."

After describing the way in which forest-destruction influences a country, the editors say: "All this is known. It is not a matter of theory, probability or opinion. It has been incontrovertibly established by repeated observations in all the mountain countries of the Old World and in our own. The results are uniform. No exceptions have been observed, and there is no question or doubt regarding these destructive tendencies and effects among those who have observed the facts which are everywhere palpable in this department of nature and of human experience. Those who know anything of the subject are agreed that, in general, the forest-clothing of mountains cannot be permanently removed without far-reaching evil results." This is proof that, although they gave him the opportunity to explain a personal point of view, Major Powell's conclusions and desires are not endorsed by the editors of the *Century Magazine*.

Exhibitions.

Chrysanthemums at Short Hills, New Jersey.

THE blooming of the Chrysanthemums was the occasion of Messrs. Pitcher & Manda's autumnal flower show last week. The exhibitions at the United States Nursery have always been interesting, and with the continued growth of the establishment seem likely to become prominent attractions to local flower lovers. I found on a visit to Short Hills the main crop of Chrysanthemums in full bloom and the show-house arranged much more attractively than last year, when a large bed of the Mrs. Alpheus Hardy occupied the entire centre. This had given place to a fine arrangement of Palms, Tree-Ferns and other decorative plants, not only attractive of themselves, but presenting a foil to the great masses of flowers which were banked on all sides. A noteworthy (it might be said to be novel) feature was the arrangement of the flowers in harmonious color-masses, each color near its complementary one and the magentas at safe distances from the oranges. Messrs. Pitcher & Manda seem also to have arrived at the sensible conclusion that naturally grown plants, judiciously, but not severely, disbudded, and cultivated only enough to bring out the individual characters of the flowers, are such as are most appreciated by the public. While they showed many fine exhibition blooms to interest the fanciers of the flowers, the main display was made up of great masses of medium sized flowers, the effect of which was very pleasing, and, what was more to the point, as the exhibition was for prospective profit, those who intended to purchase could note the true characters of the different varieties under such cultivation as would not be beyond the skill of an ordinary grower. Exhibition blooms are superb, but misleading to the inexperienced.

One of the most striking features of the collection was the surprisingly large proportion of kinds which were either seed-

lings raised by Pitcher & Manda, or had been introduced by them, most of them of very high character. Good examples of their 1890 varieties were shown, including Shasta; Mrs. Hicks Arnold; Mrs. Grace Hill, creamy pink, fine incurved; Jean Humphrey, fawn; Rohallion, very distinct chrome-yellow; and Elliot F. Shepard, lemon-yellow.

A very large lot of seedlings were showing their first blooms, and there were many promising ones among them, mostly unnamed as yet. I noted Dr. H. A. Mandeville, a clear yellow Japanese reflexed, very deep and full; Number 65, a white, hairy kind, which seems to possess some points of superiority over Mrs. Hardy, and with the same habit; Number 30, a yellow Anemone, large, with very long guard florets, very distinct; Number 24, a large, pure white, reflexed kind; Number 165, a pink one of the same style; Mrs. E. D. Adams (white), George Savage, Hicks Arnold (old gold); but these are only a few of their coming novelties. Not to enlarge on the numerous distinct flowers, mention must be made of W. A. Manda, a seedling with extra long hairs and a dark color, but not yet perfected enough to describe.

Chrysanthemums occupy but a small portion of the nursery, for long ranges are full of Palms and decorative plants of choicest kinds in great variety, every important family having a specially arranged section. The *Cypripedium*-house, which contains probably the best collection in the country, was in fine bloom, and would well repay a journey. On the stages were many fine Cattleyas, *Oncidiums* and *Vandas*. *Nepenthes* occupied spare roof room, while *Anthuriums* brightened up odd corners. Messrs. Pitcher & Manda have engaged the large hall of the Madison Square Garden, and propose giving a grand show of Orchids, decorative plants and late Chrysanthemums on Thanksgiving week and the following Sunday and Monday. The transportation from such a distance, and at this inclement season, of enough plants to fill so large a space as the Madison Square Garden seems like a great undertaking; but if the charming display of last week can be successfully transferred to the city, we shall have one of the best floral shows yet given here.

Orange, N. J.

G.

Chrysanthemums at Orange, New Jersey.

THE New Jersey Floricultural Society held its fifth annual Chrysanthemum Show in Orange last week. This is an exhibition which usually excites sharp competition on account of the liberal prizes offered, and brings together large displays from the numerous growers of the favorite autumn flower. The show this year was noticeable for some fine exhibits of new seedlings and cut blooms and the remarkable dearth of specimen plants. A Chrysanthemum show without great masses of plants and profusion of bloom is somewhat unusual. The indications are that this season will prove a great one for new seedlings of merit. Many were exhibited here for the first time. The Pitcher gold medal for best seedling plants was awarded to Mr. John Thorpe for his seedling, George W. Childs, a fine flower, full and deep, of a rich dark crimson, a color rare among Chrysanthemums. The habit is sturdy and the plant of medium height and very vigorous. Among a number of Mr. Thorpe's seedlings, Ernest Asmus, a fine bronzy chrome, was specially promising. The Pitcher silver cup for six best seedlings was taken by Mr. T. H. Spaulding with Ethiopian, Ethel Paul, John Firth, Lily Bates, Onward, Mrs. D. D. Farson. This was a grand lot of blooms, the latter especially having a flower of distinct form and good color, which may be called "La France pink." Messrs. Pitcher & Manda had a grand stand of flowers not in competition. Some of these were Mrs. Grace Hill, Dr. H. A. Mandeville (yellow), D. S. Brown (lemon-yellow), George Savage (white, seedling from Mrs. Hardy) and Hicks Arnold (old gold). They gained first premium for a seedling plant of Mrs. E. D. Adams, a very full white, somewhat in the way of Madame C. Audiguier in form.

William Tricker took first prize for fifty varieties of cut blooms, among which specially noticeable were Mrs. A. C. Burpee, Ada Spaulding, W. W. Coles, Eldorado, Excellent, Ivory, Mary Wheeler, Lilian B. Bird, Japonaise, Eynsford White, Sunflower, G. P. Rawson, Mrs. Irving Clarke, Mrs. Benjamin Harrison, Rohallion. The second prize in this class went to T. H. Spaulding. His best flowers were of Challenger, Cyclone, Mabel Ward and E. G. Hill.

The first prize for twelve blooms was taken by Ernest Asmus with Harry Weidener, J. C. Price, Sunnyside, La Fortune, etc., and William Tricker carried the second.

The first prize for six blooms went to William Tricker with Excellent, Grandiflorum, C. Orchard, Mrs. De Witt Smith, Ada Spaulding, Superbe Flore. The same grower also took first

prizes for the best twelve Chinese incurved and six Anemones, neither of which were up to first-rate standard.

A silver cup was awarded J. N. May for the best display arranged for effect—a good arrangement it was with autumn foliage.

In standard plants, John Farrell, gardener to Mr. Wm. Barr, took first prize for a lot of five-foot plants with flat trained heads—a very uniform lot, but not as useful or pleasing as the standards with untrained heads formerly exhibited by Mr. Farrell. A plant with a flat top, blooming at a height just above the vision of an ordinary observer, does not seem specially desirable, but will probably be grown as long as societies offer prizes, especially as with these the grower has no difficulty with the foliage so hard to retain on pot plants.

Low-grown plants and bushes were very few and ordinary. Mr. Farrell worthily gained the first prize for fifty plants in six-inch pots with single stems, with the best lot ever shown in this locality—grand blooms and perfect foliage. T. H. Spaulding was second in this class with a good lot.

Miscellaneous collections comprised groups of Palms and decorative plants, with a fine new *Alocasia* from Pitcher & Manda. A superb lot of Roses from Mr. J. N. May showed perfect blooms of Duchess of Albany, Ma. Capucine, La France, Catherine Mermet, Bride, F. Bennett, American Beauty and others. The new Rose, Waban—the “Red Mermet”—was on the same stand, and attracted much attention by its beauty and evident value.

Mr. H. A. Dreer exhibited a new Hybrid Perpetual Rose (unnamed) of great promise—a clear, bright rose in color. A horticultural exhibition would be incomplete without a few curiosities, and this contained the saddest examples of trained *Chrysanthemums* probably ever shown. An ingenious, not to say a misguided, grower, exhibited a series of plants the heads of which had been patiently trained to spell out his full name. Before casting too many stones at him would it not be well for growers to ask whether this is not the natural outcome and final result of the trained *Chrysanthemum* habit?

Newark, N. J.

7.

Notes.

The American Florist will hereafter be published every week. Its editor announces that it will remain strictly a trade paper, but it always contains matter of interest to readers who are not commercial florists.

It is reported that in many parts of Nebraska, from which large exports of corn were made last year, the present crop will not suffice for home feeding. This loss was caused by the severe drought.

A sweet-scented Rose “of a steel-green color” has, according to accounts in foreign journals, been produced “after experiments lasting many years” by Dr. Bonelli, of Turin, and has been named by him the “Edison.”

A recent writer in *Fire and Water* says that German chemists have discovered a means of preparing wood so that it becomes as indestructible as brick. A large hotel has just been built in Hamburg “entirely of blocks of compressed wood as hard as iron, and, by subjection to certain chemical processes, rendered proof against both fire and the attacks of insects.”

It has long been the custom to give away to the public, in autumn, many of the plants which have been used in the “pattern-beds” of the Boston parks; and this autumn the same practice was commenced by the Commissioners of Fairmount Park in Philadelphia. This is certainly the best way to dispose of such superfluous stock, although it may tend to foster an undue desire on the part of the public for the perpetuation of the bedding-out system.

The beauty of a Chinese Oak (*Quercus Chinensis*) at this season of the year is worth noting. It is a tree from the northern parts of China, which was introduced several years ago by Dr. Bretschneider into the Arnold Arboretum, where it is perfectly hardy and is growing rapidly. The leaves at this season of the year turn bright canary yellow, like those of some Hickories and some individual Sugar Maples—an autumn color entirely unlike that assumed by any of our native Oaks.

In a conversation with a reporter of the New York *Tribune*, Mr. Charles A. Dana, who has just returned from a trip through south-eastern Europe, said that one of the things which had struck him most forcibly was the great extent of the cultivation of Indian Corn in Hungary, Roumania, Bulgaria—in short, with the exception of Greece, throughout south-eastern Europe; he had never seen in the western states of our coun-

try such immense fields of Corn as in these countries. “I should say, in fact, that in a continuous journey of 600 or 700 miles we saw nothing else except as a mere incident. The Corn makes the great mass of agricultural industry.”

It would be difficult to name a shrub whose foliage turns to more brilliant colors in autumn than the Swamp Blueberry—*Vaccinium corymbosum*. It has the merit, too, of retaining its rich colors for a much longer period than most other trees and shrubs. It is still attractive, although it began to turn more than a month ago. *Rhus copallina* is another native shrub whose leaves remain a deep crimson for four or five weeks. This persistence of autumn color, as well as its brilliancy, should be taken into account when the comparative value of ornamental trees and shrubs is estimated.

Foreign journals are never tired of recounting the strange freaks of taste to which they suppose the American public gives way. The last report of this kind comes in a recent number of the *Illustrirte Gartenzeitung*, of Vienna, where we are told that “stewed Lilies” are now a recognized article of diet in this country, and that a favorite delicacy is “Rose cake,” in which layers of cake alternate with layers of stewed fruit and of Rose-petals. It is furthermore said that American ladies are in the habit of administering to themselves hypodermic injections of perfume, and of varying the essence chosen so that their morning differs from their evening odor!

The paper contributed by Dr. M. T. Masters upon the comparative morphology, anatomy and life history of the *Coniferae* to the *Journal of the Linnaean Society* has now been issued separately. This is a most important contribution to our knowledge of the cone-bearing trees, and is the result of personal observation and research carried on by the author during many years. The object of the investigation, he tells us, “has been to gain a general and comparative view of the external morphology of the whole order, to ascertain so far as possible the causes and conditions inducing the development of particular forms or modes of growth, and to inquire into the purposes of the numerous variations and presumed adaptations.”

Mr. E. P. Powell writes from Clinton, New York, under date of November 1st: “I have to-day picked from a Mazzard Cherry-tree good, sound, delicious cherries, grown in my garden. The tree was covered, just after the cherries began to color, with mosquito netting to keep off the robins. Heretofore I have finished my cherries a good deal earlier; but having five trees covered, saved one to find out how long the fruit could be preserved. The cherry will hang in good condition all summer on the trees, and be fit for use till October, or, as I have now proven, till November. There will be some rotting after September. The fruit is to me so fine and wholesome I am willing to be at some cost to have it for five months.”

Mr. James Mooney, who devoted much time to studying the Cherokee Indians, says that the aggregate botanical knowledge of their doctors embraces about 800 species of plants, although no one doctor knows the names of more than 300 species. As many as 2,000 species flourish in the regions of western North Carolina where the Cherokees have dwelt, but they have no names for even the most conspicuous flowers unless the plants are used as food or medicine; and Mr. Mooney concluded that they had no appreciation for beauty or fragrance as such. Nevertheless they must appreciate some of the qualities of plants in a semi-poetic, semi-superstitious way, for we are told that part of the ball-players’ training is to assimilate the strength of Iron-wood, the toughness of the roots of *Tephrosia Virginiana* and the persistent erectness of a Rush by bathing themselves in decoctions made from these plants.

About thirty persons responded to the invitation extended by the State Forest-Commission to members of clubs and other associations owning land in the Adirondack region to meet them at an informal conference upon matters relating to the establishment of the proposed Adirondack forest-park. All who spoke considered the establishment of such a park desirable, and most of them agreed that the first object should be the protection of the sources of the Hudson River and other streams which rise in the mountain forests. The value of the wilderness as a sanitarium, as a place for summer rest and recreation, as a hunting ground and a preserve for fish and game, was also recognized. Another conference will be held at the office of Mr. Knevals, 32 Nassau Street, in this city, on November 19th at eleven o’clock in order to obtain further expression of opinion as to the best location of the park, its extent, the most feasible method of obtaining the land required, and what should be done in relation to the area owned by clubs and other large holders.

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The Cultivation of Asparagus in France.

IN no other special culture do the French surpass to such a degree the rest of the world as in that of Asparagus. Not only is the best Asparagus raised in France better than the best of any other country, but the quality of the French crop as found in the French markets, not only in Paris, but all over the country, is far superior in quality to the Asparagus sold in the markets of other countries.

The excellence of French Asparagus is secured by the most careful and systematic cultivation, and as the French methods differ so materially from ours, especially in the practice of allowing the crowns to freeze in winter, while in this country it is an almost universal custom to protect them by a heavy mulch of manure, and in the summer fertilization of the plants, that we have asked Monsieur Henri L. de Vilmorin, who speaks of French vegetables and French methods of cultivation with the fullest knowledge of the subject and the highest authority, to describe for the benefit of our readers the methods by which the best French Asparagus is produced. The following description from his pen will be read with interest by American gardeners:

Whatever is worth doing at all is worth doing well. To no subject can that old saying be more justly applied than to Asparagus-growing, as not only is proper care a necessary condition of success, but the superiority of well grown to poorly grown produce is perhaps greater in the case of Asparagus than in any other vegetable. Both the eating quality and the market value of a bunch of Asparagus increase very rapidly with the size and beauty of the individual shoots that go to form it.

Asparagus officinalis, a native of south-western Europe, is perfectly hardy all through France and Great Britain, and will prove so over nearly the whole of the United States, where, with proper care, it should be possible to raise as fine specimens as any that are grown in Europe. In fact, Asparagus being a spring vegetable, the crop can be ready and even over everywhere before the summer heat and drought set in.

Planting the roots far apart and not too deep, and then manuring heavily and repeatedly, are the great points in the most successful Asparagus-gardens in France; and these points are, in my opinion, those that need to be brought most forcibly before the American Asparagus-growers.

Any soil which is not stiff, adhesive clay, nor pure, dry chalk, can be rendered proper for Asparagus-culture by draining, trenching and manuring. It is necessary that a depth of from one foot to a foot and a half of perfectly drained soil be secured under the surface, but this is amply sufficient, since Asparagus develops no tap-roots. Light sandy soil is quite good if properly manured.

In France it is usual to trench and manure in the fall with common stable-manure the plot which is to be planted out to Asparagus in the spring. In very light soil cow-manure is preferred. In March the rows or beds are marked out, the position of each set being indicated by a small stick placed in the ground. One or two-year-old seedlings are generally used as sets. They are never planted at a less distance than two feet each way. For exhibition purposes plants are set three and even four feet apart.

At the place where each little stick stood a small conical heap of compost or mould from thoroughly decomposed manure is made, and the centre of the crown of the set is placed on top of it, the fleshy roots being spread, radiating in all directions down the sides of the small hill. The roots are then covered with additional compost or mould, one or two large handfuls being used on each set; the roots only, and not the crown, being so covered, the hills are made larger, but not higher, by the process. Loose soil is then filled in between the hills and level with the crowns of the sets. This soil has been prepared by scraping the surface of the beds three to four inches deep before marking out the place for the sets and by heaping the loose soil in the walks between the beds or the rows.

After the first summer and fall, when only weeding, and, perhaps rarely, watering has to be done, the surface soil is in the month of October scraped off between the plants and made into a ridge in the walks, as was done before planting. The roots are by this means brought close to the surface and submitted to the action of cold air and frost, which, at least in Europe, seem to benefit them rather than otherwise. Only experience can show whether the same system would be equally advisable for America, where the winters are so much colder.

Manure is spread the second spring on the roots mostly in the shape of mould from town scrapings or from decomposed stable manure. Common salt may be added with good results in places where it is deficient in the soil. Then the loose soil is again filled in on top of the manure and between the plants so as to make the surface even.

The next year the same processes are repeated, but the loose soil is heaped to a greater height, in a conical hill one foot high, over each Asparagus plant, as from this, the third spring, one or two shoots can be cut from each well-established plant. The hill formed on top of the crown is intended to bleach the shoots and to force them to become longer. After the cutting season is over (which should be about May 15th on the year of the maiden crop and June 15th on succeeding years) the mounds of soil are to a great extent scattered and spread in between the plants, all the shoots produced later being allowed to grow and develop into leafed stems.

Afterward the routine of the cultivation remains the same, manure being added at least every second year, and either in the fall, in winter or in early spring, in fact at any period between the time when the surface soil is scraped out and the time for spreading it on again. The number and beauty of the shoots go on increasing for the three or four first crop years, and then the plantation can be kept at its best for five or six years more by liberal and repeated manuring.

Great care is exercised now, in France, in gathering Asparagus-shoots to break them clean at the point of insertion on the crown, and not to cut or saw them off. The latter practice had the two-fold fault of leaving on the plant old stumps which decayed and often induced rotting of the crown itself, and besides it frequently occurred that undeveloped or partially developed buds were injured by the knife and destroyed. At the present day the most approved practice consists in throwing back with one hand the soil of the hill, while holding the shoot with the other hand and in following it down to its base, when it is easily broken off clean by bending it on the side on which it was laid bare. The hill is then immediately formed again as before.

All this care and labor might justly be considered excessive were 200 or 300 shoots required to make a decent dish, but they can well be afforded where fifty make a very large one.

The taste for almost white asparagus, with only one inch or so of purplish top, is prevalent in France, but the shoots may be allowed to grow a little longer and greener when they are preferred so.

It should be added that asparagus, to be at its best, must be gathered only a few hours before it is cooked. In most cities and towns there seems to be an unlimited demand for asparagus, fine, medium, and even poor. Still good fresh specimens always command a much higher price than small wiry ones, or than asparagus brought from a distance.

THE general ignorance which prevails in this country with regard to trees, and especially with regard to the simplest phenomena of their lives, is always a matter of surprise to the few persons who study the different phases of tree-life and look on the trees they pass in their daily walks, or in longer journeyings, as old friends and companions. We recall the instance of a person of more than ordinary intelligence and cultivation, possessing the instincts of a naturalist, shown in an unusual love of animals and in a fondness for studying the habits of bees, ants and other insects, and who, moreover, was bred in the country. This person, when past middle life, learned for the first time that Oak-trees had blossoms and that the cones of the Spruce had grown from flowers. Trees had been taken as a matter of course, and passed by year after year without a thought bestowed upon the secrets of their existence. The individual flowers of the Oaks and Walnuts, the Beeches and Alders, the Birches and Hornbeams, the Pines and Spruces, had never been seen, and the beauty of their marvelous structure had never been so much as dreamed of.

That ignorance of this sort is not unusual is shown by the fact that we find in common use the terms "flowering trees" and "forest-trees" employed as if some trees, like the Apple or the Locust, produced flowers and others growing in the forest did not, and this by authors from whom better things might naturally be expected. All this only goes to prove that we in America need more instruction about our trees than we are in the way of obtaining. Some accurate knowledge of the common trees which surround our homes and make up our forests should form part of the mental equipment of every educated man and woman. Knowledge of this character adds immensely to the pleasures of life. Once gained it is never lost; and the field is never exhausted, for there is always something new to learn about a tree.

This is a subject of wide-spread and practical importance. Trees collectively, that is when they form forests, have an important influence upon the destiny of the human race. Americans are destroying their forests with a recklessness unknown to any other people. This recklessness is the result, in a large measure, of ignorance, and if the value of our forests is ever really understood it will be through the intelligence of the individual trained to appreciate them. How can this intelligence, which, if once acquired, will, perhaps, eventually make the protection of forests possible through wise and far-seeing legislation, be developed? There is certainly no more practical way to begin than by teaching the children of the country something of trees. Knowledge in such matters, especially if acquired early, begets affection, and affection for the individual tree as a tree once fixed, it will be a comparatively easy matter to build up in a community, trained from childhood to love trees, an intelligent interest in the forest in its practical relations to humanity.

Field Notes from the Colorado Desert.

ON the 15th of September I left San Diego by rail for Yuma, Arizona, to make botanical collections in the region generally known as the Colorado Desert, in south-eastern California. At Yuma I found that the season had been slightly drier than usual, and there was scarcely any vegetation except along the banks of the Colorado River. I had the pleasure of experiencing one of the heaviest rains of the season, a brisk shower that lasted about half an hour, accompanied by considerable wind.

Opuntia tessellata was fruiting on the hills near Yuma, and I have since found it in various portions of the desert. The fruit is small, dry, with comparatively few large seeds. This

and one or two other species of the same genus were the only Cacti seen on either bank of the river, except a few transplanted in gardens and a single beautiful plant of *Mamillaria*, found on the sandstone hills south of Fort Yuma, in San Diego County, California.

From El Rio Station, on the Southern Pacific Railway, I walked southward over the hills bordering the Colorado River to Hanlon's Ranch, better known in former times as Hanlon's Ferry. The old station-house, on a rocky bluff at what was once the ferry landing, is now over a mile from the river bank, the river having cut its way to the eastward. This new-made land is subject to an annual overflow and is extremely fertile. It is grown up to a forest of Cottonwoods, Willows and Mesquite-trees of magnificent proportions, and the growth of underbrush and other vegetation is very luxuriant.

Mr. Hall Hanlon, one of the few remaining pioneers of early days, since the advent of the railroad has turned his attention to stock-raising and horticulture. He has been the first to demonstrate the practicability of cultivating the Date in the Colorado Desert. In 1884 he had fully a hundred Date-trees nearly ready to bear, but, unfortunately, an overflow of the river on his land and a combination of other disasters, nearly destroyed them. The Date comes into blossom in five years from setting on his ranch, and he had a supply of fruit in eight years from the planting of the seed. He has two varieties in bearing now, one with large yellow fruit, and a smaller kind with beautiful, rounder, reddish fruit, which at the time of my visit hung in tempting clusters from the trees. Hundreds of offshoots from his trees he has planted out, and in a few more years he could have one of the most profitable and novel of California orchards, or fruit ranches as they are generally called. Other experiments in the culture of the Date were soon to be made near Yuma, Arizona, in the Gila River Valley, which is very aptly called the Gila Desert to distinguish it from the Colorado Desert that lies west of the Colorado River.

Traveling westward from Fort Yuma I found an almost unbroken, barren plain, destitute of verdure until near Indio, in the north-eastern portion of the region. In the Cargo Muchacho Mountains, where several gold mines are being developed, I found it equally uninteresting from a botanist's point of view, except where the "tailings" and waste water from the quartz mill were allowed to flow. A few grasses, one or two introduced weeds and a number of wild flowers—several new to me—were thus caught out of season.

Indio, and the section of the desert to the westward, is probably the best known portion of the region as far as its botanical resources and horticultural possibilities are concerned. The Washington Palm-trees, on the open plains and on the sides of the mud hills to the northward, form one of the most interesting features in the landscape, since the Californian Fan Palm elsewhere is of a more retiring disposition, seeking the seclusion of rocky and almost inaccessible cañons. Some of the Palms grown in the grounds around the railroad hotel at Indio are of most luxuriant growth—a single leaf almost sufficient to shield a standing man from observation!

On the 1st of October I again set out for the southern borders of the desert with a two-horse team. The reports of the great overflow of the Colorado River, through the New River section, had been confirmed by reports received at Yuma, and it was with a view of securing the consequent vegetation that I undertook this trip. It has been six years since the last great overflow occurred, in 1884, and the chance offered by the June and July overflow was one not to be neglected. La Laguna Maquata, a shallow basin just south of the United States boundary, usually dry, was also reported full of fresh water from the same overflow, and said to be teeming with fish. No water has been known in this lake since 1884 either, and here was another opportunity.

At Mountain Springs we filled all our water-cans, fearing that this might be the last good water we should find, and it proved fortunate that we took the precaution. At Coyote Wells, fifteen miles distant, we found the water unfit for man or beast, but by digging a new well we were able to secure a limited supply of strong alkali water, which we ventured to give our horses. The only feed was some Gietta Grass, about two miles distant from our camp. Proceeding in a southerly direction from Coyote Wells we traveled over a sandy, rolling country to a point in the Maquata Basin between the Cocopah and the main peninsula-range of mountains. The western shores of the lake were dry and strewn with millions of fresh water shells, which encouraged us to expect to find some fresh water. Along the sandy arroyo leading to the lake were numerous beautiful Ironwood-trees, fifteen or twenty feet high, and nearer the shores of the lagoon were bush-like clumps

of Mesquites, around which the sand had blown into mounds or small hills. Nearer the lagoon the Mock Willows (*Pluchea borealis*) gave evidence of fresh water, which could, doubtless, have been obtained at less than twenty feet by digging. *Sesuvium portulacastrum* and a few other saline plants were also very abundant; but these comprised nearly the whole of the vegetation discovered along Maquata's shores.

A beautiful mirage led us away from the actual water, and upon learning its delusive character we became skeptical as to the existence of water in any part of the lake. Although I had often seen this phenomenon on the desert I had never before been led astray. In the evening, however, we were enabled to distinguish the true from the false, and found that the eastern part of the lake, for many miles to the southward, actually contained water. On the mesa west of the lake we made our camp, about three in the afternoon, where there was an abundance of Gietta Grass (*Hilaria rigida*) for our horses. Leaving my companion to care for the team, I started on foot to search for water in the cañons leading down to the desert from the main range of mountains, but failed to discover any up to seven o'clock, when it became too dark to proceed, and I was reluctantly compelled to retrace my steps as best I could. My landmarks, the mountains, were soon indistinguishable, but taking my bearings from the stars I got back to camp soon after eleven o'clock after an eight hours' tramp.

Before sunrise in the morning we were again en route to the lake, and after two hours' travel arrived near the edge of the water. With difficulty I reached the water through the soft mud, and found the water so shallow at that place that I had to dig a small hole before I could dip up any to taste—and then I found it to be nearly as salt as brine!

With our water supply nearly exhausted, the temperature at 105 degrees Fahr., and thirty miles from any sure source of water, we considered it only prudent to return to Coyote Wells while we could. For two days our food had consisted mainly of hardtack, and on our return to Coyote Wells the wind prevented our cooking a good meal until the following afternoon.

From Coyote Wells we have moved to Dos Cabezas, where there is an abundance of water, and we are partially sheltered from the wind and rain. It is necessary to pile rocks on the blankets to keep our bed from blowing away with us, and the wind blew my loaded wagon a considerable distance during the night. The sun is shining brightly as I write, but before I finish this sentence the black clouds hanging over us to the westward will have flung us in the shade again. From tropical heat we now find a fire-place a comfort.

Whether reports concerning New River are equally as trustworthy as those relative to Lake Maquata we hope to decide later, but it is necessary to haul water for fifty miles at least to settle the question, and to be prepared to return if we do not then find it. These are some of the pleasures of botanical exploration in our great arid regions.

Dos Cabezas, Colorado Desert.

C. R. Orcutt.

Lumbering in Michigan.

SIXTY years ago Michigan was almost entirely a wilderness, and a good portion of it was covered with virgin forests. Nearly all of the southern half of the southern peninsula abounded in deciduous-leaved trees, while north of this were large tracts of Pines and other conifers, or a forest of conifers and deciduous trees mixed in varied proportions, or there were some large areas consisting entirely of deciduous trees.

The pioneer, finding no market for his timber, used a small portion only of the very choicest for his limited needs in building and fencing. He cut and burned, hewing for himself a home out of the forest, making room for cultivated fields in place of trees. Gradually, but slowly, a market was found for timber. At first, only the best cuts of the choicest trees could be sold at any price. In southern Michigan, about the year 1850, I drew for my father many loads of the choicest clear stuff of Whitewood or Yellow Poplar (*Liriodendron Tulipifera*) fifteen miles, where it was sold at \$5 per 1,000 feet, and the pay taken in goods at a country store. Even this market was limited, and was found in the Oak-openings. There was not much money in lumbering in those days. The trees, though, had to be got out of the way and made to bring what they would.

It was scarcely more than ten years later (1860) that in the same region farmers had nearly ceased burning log-heaps and had begun to make use of all the timber taken from new land for lumber, rail-fences, fire-wood for themselves or their neighbors or for the nearest village or railway. This was in a country long since noted for its good land and prosperous

farmers. In fact, Lenawee County, Michigan, is known to be one of the very best "all-round" counties in the United States for diversified agriculture or mixed husbandry.

In newer portions of the state, many parts of which for some reasons were less suited for agriculture, the removal of the timber has been at a much slower rate. It is now as rare a thing as it was common once to see Hemlock-trees felled and left to rot or burn on the ground, simply to secure the bark for the tannery. The hard wood is now, in 1890, nearly all saved, even in the least settled portions of the state, for lumber, for the railroad or for charcoal. Still there are a few places, remote from market, where the tops, butts and deformed sticks of soft wood or hard wood are not very closely used up, but are allowed to decay on the ground.

When good farming land, or poor land that is covered with desirable timber, has once passed from state control the owner feels that something must be done with the timber very soon to prevent a losing investment. It has usually been the experience of Michigan men that it has not been profitable to hold timber for higher prices, and few people will attempt to hold it simply for the good of the township or state or for posterity, under such circumstances. Had a much larger proportion of the timbered land been held and protected by the Government for a longer time the state would have been much better off in the end. Less timber would have been destroyed, the land that was improved would have been better worked at a greater profit. This is a lesson which should be heeded in the more recently settled portions of the country.

There is too much risk from fire in most places in Michigan to make it wise to hold for a very long time any large amounts of land covered mainly with evergreen trees. Where there are a few evergreens mixed with forests of deciduous trees the risk is very greatly reduced.

The illustration on page 563 shows what remains after fire, following the axe, has run through the woods and consumed the smaller branches. Sometimes the logs are brought together in heaps and burned, or allowed to gradually disappear by a combined process of decay and repeated burning.

Agricultural College, Mich.

W. J. Beal.

The Lakeside Daisy.

AN interesting item in the botanical record of the season is the finding in Ohio of an *Actinella*, which seems to have strayed away from its home in the west. Mr. Clarence M. Weed, of the Ohio Experiment Station, gives the following account of the matter, which we take from the *Journal of the Columbus Horticultural Society*. Accompanying the article is a good figure of the plant, *Actinella acaulis*, from a drawing by Miss Freda Detmers.

Early last May while collecting botanical specimens in northern Ohio, on the limestone plains of the Sandusky Peninsula, near Lakeside, I came across many large patches of a very pretty bright yellow flower, which formed by far the most striking element of the local flora. It proved to be *Actinella acaulis*, Nuttall, the ordinary home of which, according to Gray, is found on the "Rocky Mountains and bordering plains and hills, Dakota to Montana, and south to New Mexico, western Nevada and Arizona."

Not only is this particular species a western form, but *Actinella* as a genus is essentially western. Its representatives occur especially in the rocky prairie and mountainous regions of the extreme western states: Dakota, Montana, Colorado, Texas and New Mexico are the homes of many species. According to Gray's "Synoptical Flora" the only known occurrence of a member of the genus east of the Mississippi River is that of *A. acaulis*, variety *glabra*, which was found many years ago on "an ancient mound at Joliet, Illinois," and its occurrence was said to be "probably adventive."

In northern Ohio *A. acaulis* is thoroughly established, and evidently finds on the barren limestone plains, with their two or three inches of soil, a congenial habitat. Dr. C. E. Bessey tells me that in Nebraska it occurs in a somewhat similar situation, being found on the rocky buttes where there is very little soil.

No one about Lakeside, so far as I could learn, knows anything about the time the plant was introduced. The only reply to my question as to how long the plant had been there was that it had been noticed as long as the speaker had lived there. I have found it nowhere in the region except about Lakeside. The Lake Shore Railroad is about ten miles south of the place and a branch road now runs up. But the latter has

only existed a few years, being constructed long after the plant was present. Just how it made the thousand-mile journey eastward may never be known. But, nevertheless, the beautiful little waif is with us, and forms a very welcome addition to our Ohio flora. It has received the local name of Lakeside Daisy.

If this plant could be successfully cultivated it would make a valuable addition to our list of spring bloomers. The bright yellow blossoms in compact masses, coming so early in the season as they do, would supply a place now vacant.

Notes on the Plum Curculio.

THIS insect is still one of the most serious of our orchard pests. It attacks not only plums, but apples, pears, quinces, peaches and cherries, and disfigures where it does not destroy. Experiments looking to the destruction of this pest have been and are still made in some of the western states, and a good measure of success has attended them. In spraying for the codling moth a large number of the beetles are killed and the fruit is largely protected. Quite early in the season of 1890 I noted, in collecting on the June-berry (*Amelanchier Canadensis*), that many of the half-grown berries had the peculiar crescent mark indicating Curculio. A little beating about gave me a number of specimens of the mature beetle, so that the true culprit was not in doubt. The berries were, many of them, infested by a coleopterous larva, which I did not succeed in bringing to maturity, but which was not this Curculio. I have no real doubt, however, that the pest does breed in the June-berry if its more usual food-supply is scant. I had noticed in previous years that many mature apples showed scars of Curculio crescents, and sometimes even traces of a short gallery, evidently made by a young larva. It has been known that Curculio acts differently in different kinds of fruit, and that while it caused plums to drop, it did not have that effect on apples.

Based on these observations I made a few experiments this past season. I gathered on one day a lot of punctured plums and apples from the ground beneath the trees and placed these in separate jars on moist soil. I gathered from the branches of Apple-trees a number of apples showing many punctures, taking one or two out of a cluster and marking the branches. These plucked apples were separated into two lots—one placed on moist soil and one placed in a dry jar and kept changed as to position so as to prevent rotting. Another lot of apples, further advanced and showing only punctures apparently some days old, was plucked and placed on moist soil.

The apples and plums picked from the ground and placed on moist soil developed all, or nearly all, the larvæ. I believe there could not have been a difference of ten per cent. between punctures and mature larvæ. In some small apples as many as nine full grown larvæ developed! The apples plucked from the tree and placed on moist soil also developed a very large proportion of the mature larvæ. Those placed in the dry jar withered and did not rot, and did not mature a single larva! A fair proportion hatched, but as there was no decay the larva perished.

Of the more advanced apples with older crescents, placed on moist soil, a fair proportion hatched and came to maturity. While the larvæ were developing in my breeding-jars I made periodical examination of my marked branches, picking apples and cutting down on the Curculio crescents. In most cases the eggs never hatched; in some few instances the young larva did make its appearance, only to succumb before it had penetrated very far into the fruit. All the fruit examined which did not drop had not matured a single Curculio larva. It seems to prove that the larva needs a decaying substance to feed upon, and the matter is important in this wise: If all the dropped fruit in an Apple (probably also Pear and Quince) orchard is regularly picked up and destroyed, it would prevent the maturing of any larvæ in such orchards, and, by lessening the number of beetles, would of course lessen next year's damage. The obvious application is to the point so often urged by entomologists—keep the orchards clear of fallen fruit, and begin just as soon as the fruit begins to fall. By far the greatest amount of Curculio injury results from insects bred right at home, and this is especially true in the case of isolated orchards.

Rutgers College.

J. B. Smith.

The simple and uncombined landscape, if wrought out with due attention to the ideal beauty of the features it includes, will always be most powerful in its appeal to the heart.—*Ruskin*.

New or Little Known Plants.

Solidago speciosa.

NO figure, it appears, has been published before of this handsome Golden-Rod, which is one of the most distinct and best marked of the numerous species which inhabit North America, and which, with the Asters, form the characteristic and the most striking feature of our autumnal flora. *Solidago speciosa* (see page 561) is a stout, smooth plant, with tall stems four to six feet high, and ample, ovate or oval, slightly serrate leaves; those on the lower part of the stem are contracted into long, broad petioles, while those higher up are short-stalked, or nearly sessile, and narrower, or oblong-lanceolate. The heads of bright, canary-colored flowers are crowded in erect racemes, forming a narrow, pyramidal panicle five or six inches long and one and a half or two inches broad.

Solidago speciosa is scattered from Canada and eastern New England to Minnesota, Arkansas and the mountains of North Carolina. It inhabits the borders of woods and copses in rich, rather moist soil. It is not a very common plant, and in New England it is one of the rarest of the Golden-Rods. Our illustration is made from a wild plant collected by Mr. Faxon in Newton, Massachusetts.

Foreign Correspondence.

Berlin Letter.

NOT long ago a meeting of German forest-officers was held at Cassel, and one of the subjects discussed was the naturalization of foreign forest-trees in Germany. Some foresters have been opposed to the introduction of exotic trees, while others have urged that tests should be made to determine whether the acclimatization of certain species would not be possible and profitable. These tests have been insisted upon because it is only by experiments that any true idea of the value of foreign trees for us can be obtained. The study of their growth in their native countries has little value for us because a profitable growth is the product of so many influences which differ widely from those surrounding them at home. After some less important tests made by the possessors of private forests in the year 1882 there was founded under the direction of the Government stations for various trials of this sort in all the German states. In the kingdom of Prussia alone there have been paid out in these eight years \$80,000 and nearly 1,500 acres have been planted with foreign trees. The delegates from Bavaria and Brunswick gave the results of similar experiments from their countries, which were generally successful.

The exotic trees tested may be arranged in three groups, as follows: 1. Those whose success has been demonstrated, including the Douglas Fir, the Tideland Spruce (*Picea Sitchensis*), Lawson's Cypress, Red Cedar (*Thuja gigantea*), Black Walnut, Shellbark, Mocker-Nut and Bitter-Nut Hickories and the Red Oak. 2. Those which excel German trees only in certain districts, including the Pitch Pine, the Red Cedar (*Juniperus Virginiana*), Nordmann's Fir, Sugar Maple and Black Birch. 3. Such as do not grow or are not worth cultivating, as *Pinus Jeffreyi*, *Pinus ponderosa*, Red Ash, White Maple, the California Maple, the Pig-Nut Hickory and the Big Shellbark (*Hicoria sulcata*). Allow me to add to this that there are some varieties of Douglas Fir which will not grow here at all, some which suffer from low temperature, and others which are among the best coniferous trees we have. The same is true of Lawson's Cypress. In the winter of 1879 and 1880 we had a good stock of this tree at Proskau, in upper Silesia, each plant being a fine specimen six feet high. In February snow fell to the depth of three feet and the temperature sank to thirty-two degrees below zero Fahr. Every tree died down to the snow line, but all started well the following year from the part below the snow, which had remained healthy. In the same winter the Pin Oaks did well. I cannot understand why such an unfavorable opinion of the Black Birch was expressed, as it reaches a large size in St. Petersburg, and it does not suffer in a temperature many degrees below zero. Seedlings of the White Maple, too, I have found to resist a cold of the same intensity.

The fruit-growing industry of northern Germany is beset with many difficulties, the chief of them now being the high railway rates, which prevent the transportation of fruit to

Fig. 74.—*Solidago speciosa*.—See page 560.

southern Germany, where large quantities are used. This market is supplied from Austria because of lower prices, although the north German fruits are of better quality, and would be used if the railway rates were cheaper. Horticulture, too, is suffering much from natural and artificial causes. The countries which border Germany have high duties on imports,

while Germany has none; therefore the German nurserymen are prohibited from exporting, but the neighboring countries can send in cut flowers, vegetables and pot-plants at such low rates that it is impossible to compete with them. The horticulturists are urging upon the Reichstag the establishment of duties, but meanwhile the Berlin Horticultural Society has been

doing what it could to help by establishing horticultural experiment stations, out of its own funds, at which investigations are to be made to ascertain if there are feasible methods of raising plants and vegetables in a shorter time or at a lower price by the use of artificial manures. It is to be hoped that the state will create a larger station with similar objects. A greater disaster was last summer brought upon the nurseries in Saxony by the flood of the River Elbe, which overwhelmed many of them. All the plants in the greenhouses and hot-houses, with the exception of *Rhapis flabelliformis*, were lost. The distress has been so great that collections are now taken up throughout the whole empire for the sufferers. Money as well as plants and seeds and cuttings are welcomed. If any German nurseryman in America should read these lines he might help his brethren in the old world by sending money or cuttings to the Vorstand des Verbandes deutscher Handels gärtner at Leipzig. "Die noth ist furchtbar."

It may be of interest to American women to know that more than a year ago a school of gardening for women was established here. It has a three years' course, during which time the general art of gardening is taught theoretically and practically. Opportunity is also afforded for training in any special department of gardening, and a section devoted to landscape-gardening has just been started. The classes have already won some medals at different exhibitions. There is also a ladies' society to encourage plant-growing at home. Its members are wealthy, and they offer gold and silver medals for pot-plants.

Of the floral novelties grown this year the most important is a Begonia which seems to be a cross between the variety Diadema and some other form of *B. Rex*.

Berlin.

Udo Dammer.

Cultural Department.

Early Chrysanthemums.

THERE seems to be an increasing interest in the effort to secure early blooming large-flowered Chrysanthemums. No doubt if our borders could be filled from late August or early September till hard frosts with satisfactory specimens of these free-blooming, showy plants it would be a great gain. The prospect of success in that direction seems to me slight; and judging from the progress made, and from the nature of the species, it does not seem that good early Chrysanthemums in the open air will ever be abundant in this latitude. The Desgranges (Madame C. Desgranges, G. Wermig and Mrs. Hawkins) are the best of the early large flowering varieties. Madame Desgranges has been cultivated for some years, is of undoubted merit and at present is the most favorable example which can be named of the race. This variety with me is a fair grower, rather dwarf in habit and with a decided tendency to rust. Of course, with care, it may be kept in good condition as to foliage. It is a simple matter to bring it into full bloom in late August or early September, and well grown flowers are very satisfactory if protected. The difficulty is just here—good, deep, full Chrysanthemum-flowers are very quickly ruined by rains or excessive moisture, and need overhead cover; any such cover will make them so delicate that they will be quickly scorched by the torrid sun which often prevails at that season, and usually an early frost will sear plants before the flowers wane if unprotected. On a border under the south side of the house Chrysanthemums are at this writing (November 15th) still in full bloom entirely untouched by frost—we have had five degrees once—and in such a position it might seem that early kinds could be successfully grown. Possibly the culture might be a success if such weather could be depended on, but this is the first time in a decade when such conditions have prevailed, and one chance in ten is scarcely satisfactory. With us killing frosts may be expected any time after September 20th, and after that date protection may be required at any time, though usually plants are safe till October 15th. Now, with the drawbacks as stated, it does not seem worth while to grow a race of flowers which at the best are of inferior merit to the later kinds at the necessary expense of time and trouble, when the space can be used for fine mid-season or late ones.

In the early season, also, Asters are in season, and likely to be more satisfactory. The early Chrysanthemum is not for me, except for a trial of new varieties as a matter of interest, and I am well content to wait till early October, when, with the keen frosty air, one can enjoy the beautiful blooms of Madame Lacroix, Lady Selborne, William Holmes, William Cobbett, M. E. Nichols and others. The Chrysanthemum is surely a cold weather flower, and naturally at its best at that time. To use a homely analogy, it is somewhat like Celery. The early

Chrysanthemum is no more like the later ones than the stringy, rank celery of August is like the crisp, nutty celery of late fall. This quality seems inherent in the nature of the plant, and probably can be little changed by cultivation or selection.

Where an effort is made to have successive displays of good showy flowers it would seem that large breadths of Japanese Anemones are more desirable and satisfactory flowers in the same season for such a purpose than the early Chrysanthemums. They are among the choicest and handsomest of hardy plants and the very best of hard weather flowers, preserving their purity and beauty through the severest storms of wind and rain and not affected by an ordinary frost.

Elizabeth, N. J.

G.

Notes from the Harvard Botanic Garden.

CENTAUREA AMERICANA.—This plant, and its variety, *Hallii*, are both well worth trying in the garden. They are annuals, natives of the southern states from Arkansas to the border of Mexico. The typical form has a smooth, occasionally branching, stem, which averages about four feet in height under cultivation here. In its natural state it is sometimes six feet high. The alternate, sessile leaves are oblong-lanceolate, and gradually diminish in size until the smallest at the summit measure about one and a half inches in length. The terminal flower-heads measure four inches across when fully expanded, the exterior florets being of a rich rose color, and those of the centre somewhat paler. The flower is handsome, and remains for a considerable time in perfection on the plant or in water. The variety differs from the type in that its growth is slightly more delicate, the leaves approaching ovate-lanceolate, and its flowers are deep purple. Sow the seeds under cover early in spring, in a temperature not lower than fifty degrees. Transplant, when large enough, in a frame where growing heat can be maintained for a time; harden off the seedlings as the weather grows warmer, and finally remove them to good soil in a sunny part of the open garden in late spring. The flowers will appear early in August, and continue to appear until the plants are cut down by frost.

CHRYSANTHEMUM ULIGINOSUM.—This plant, the *Pyrethrum uliginosum* of Willdenow, affords a grateful mass of showy flowers in September and October, and its habit of growth makes it useful in the garden at a time of year when good flowering plants are scarce. It is a native of Hungary and quite hardy in Massachusetts. The stems are from four to five feet high, thickly furnished with sessile, lanceolate, serrate leaves, and branched at the top. A single stem produces from nine to a dozen branches, which in their turn bear, according to strength, from one to four Daisy-like flowers three inches across, and pure white, with bright yellow disc. It is a most useful plant for the back lines of an herbaceous border, and strong clumps dotted about among dwarf shrubs have a telling effect. A soil of medium quality and moderately heavy is the most suitable, for, like most of its kindred, it is a voracious feeder. It is of importance, more for the quantity and quality of the flowers than for the appearance of the plants, that as many as possible of the leaves be kept in healthy condition until the flowers are past their best. This is a task of some difficulty in very dry seasons, because the lower leaves are much inclined to wither and fall in time of drought. A light mulching and occasional supplies of water will be beneficial in such extreme cases.

CROCUS SPECIOSUS.—The showy flowers of this lovely species have a strange look now as they peep above the earth just as the fall frosts come, and very bravely do they withstand the alternation of heat by day and cold by night up to about the middle of October. They are almost three inches across when open in the sun, and it is then that they are most charming. The soft lilac of the segments is profusely marked with diverging and intersecting lines of deep purple, the colors being most distinct and beautiful in the interior. The showy yellow anthers and stigmas of a deeper shade afford a desirable variety of color. The leaves, differing but little from those of vernal Crocuses, appear only in spring. In its native state, according to Baker, the plant is distributed from north Persia and the Caucasus, through the Crimea, to Hungary and Transylvania. It is the most desirable and reliable autumn-flowering species for this climate. Plant the corms in any good garden soil and in a position where they will not be disturbed. They do best and bloom most freely when left to themselves, merely keeping their quarters clear of weeds and covering with soil any corm that seeks the light.

DIANTHUS PLUMARIUS SEMPERFLORENS.—This plant is said to be the result of crossing *D. plumarius* with a Carnation; but whatever its origin, it is a most desirable one. It has proved hardy here, having stood out all last winter with only a slight covering of protecting material. The growth is dense,

but straggling rather than compact, a habit rendering it an admirable subject for the rock-garden. The flowers vary from light to dark rose, with darker band in the centre. They are pleasantly fragrant and sometimes measure almost two inches across. They are flat in general, and invariably single, with the edges irregularly toothed. The mass of bright glaucous foliage forms an appropriate ground for their more brilliant colors. But the best quality of the plant is the freedom and persistence with which the flowers are produced. Since early summer, through storm and drought, up to this first week of November—and we have had several frosty nights—flowers might have been picked any day from the same plants. They are of a deeper color and smaller, but still beautiful and fragrant in this colder weather. Any of the forms may be perpetuated by propagating from cuttings, and, subject to the slight variation already mentioned, the plant may be readily raised from seed. Our plants were raised from seeds for-

TRICYRTIS HIRTA.—This is an interesting Liliaceous plant, commonly called the Toad Lily (in reference to the profusely spotted flowers), and introduced from Japan in 1863. In this locality it is perfectly hardy, with simple or distichously branched hirsute stems from three to four feet high; alternate, stem-clasping, ovate, deeply veined, hirsute leaves, and shortly paniculate axillary inflorescence. The bell-shaped flowers, an inch or more across, are borne on pedicels about an inch long, the divisions being white densely spotted with purple on the upper surface. The conspicuous filaments are similarly marked. The flowers are extremely pretty at short range, produced in large numbers during October and November, and they last until destroyed by severe frost. Those at the top of the stem are the first to develop, and they open downward in succession. The plant likes partial shade and good soil, and will extend rapidly if left to its own way under these provisions. It is most effective in masses of a dozen or more,



A Michigan Forest of the Present Day.—See page 559.

warded by Mr. W. Thompson, of Ipswich, England, some two years ago. It is a new plant to this country, and, considering the severity of the climate, one with a most promising future.

SOLIDAGO DRUMMONDII.—This species is the last of the Golden-rods to flower. It is a highly ornamental plant, commencing to bloom early in October, and still in flower, though fading somewhat early in November. The stems are rather slender, three to four feet long, and from the weight of the flowers frequently prostrate if not secured by staking. The dark green of the ovate, serrate leaves contrasts well with the vivid yellow of the abundant flowers. Planted freely on a steep bank, that from its situation will not be allowed to get very dry in summer, and allowed to grow in its own way, without tie or prop, the effect is strikingly beautiful. The flowering-stems impart unmatched elegance to floral decorations. The plant likes partial shade and good, retentive soil. It is found from Illinois and Missouri to Louisiana.

and when these masses attain large dimensions, as they will in a few years, the roots may be separated late in autumn for fresh plantations. It is possible to propagate more closely by removing the offsets yearly.

Cambridge, Mass.

M. Barker.

Notes on Shrubs.

IT usually happens in this latitude that at least three-fourths of the deciduous trees and shrubs lose their leaves by the first week of November. Sometimes, however, there is considerable variability in persistence of foliage even among plants of the same species, although, as a rule, all of a kind may be fairly judged by the behavior of two or three healthy individuals growing under normal conditions.

After several severe frosts the best foliage of all the species of *Clematis* in the collection is that borne by the Japanese *Clematis paniculata*, which still appears as fresh and green as in

midsummer. *C. Vitalba* is in almost equally fine condition, and *C. Viticella* also maintains a fairly fresh look. The leaves of nearly all the other species have either ripened and fallen or they have been totally or partially destroyed or blackened by frost. None of the species here assume bright autumn colors, but the leaves of a few occasionally have a purplish aspect.

There is no hardy dwarf shrub which surpasses the Yellow-root (*Zanthorhiza apiifolia*) in brilliancy of late autumn foliage, none of which has fallen at the end of the first week of November. The leaves at this time are brightscarlet and orange in color, and this autumnal glow constitutes the chief value of this plant for ornamental planting. It is perfectly hardy, and as it only grows from one to two feet high, and spreads from underground shoots, it is admirably adapted for planting as an under-shrub in open places or at the edges of the shrubbery.

The species of Strawberry-bush (*Calycanthus*) generally lose their leaves by the end of October, and although they sometimes become yellowish they usually fall without showing much or any autumnal color. Considering the profusion of flowers which it bears, it is surprising how seldom such a hardy species as *C. levigatus* bears fruit. Very few of the people who are familiar with the strawberry-scented flowers know the rough, stout pods or hips, several inches in length, and filled with large brown seeds. Occasionally a few hips are produced on plants in this region, and they are so formed that they may remain suspended from the branches for a year or more and retain the seeds in a perfectly dry condition and unaffected by the weather. It would be interesting to know the manner of the dispersion of these seeds in the native habitat of the plant in the Alleghanies, and whether anything more than the disintegration of the hips and consequent liberation of the seeds is provided for. If the seeds only escape by the decay of the hips they must retain their vitality for a considerable time.

Among the Barberries the only one that is perfectly leafless by the 1st of November is the Asiatic plant known as *Berberis Amurensis*, but which is often accounted only a geographical variation or form of the ubiquitous *B. vulgaris*. Its stiff, unbending, upright habit, as well as some other minor differences, render it easily distinguishable from the last named and all other kinds. Its upright habit is imitated by another Asiatic species, *B. Sieboldii*, which retains its crimson and orange foliage a little while longer. In the common Barberry persistence and coloration of foliage in autumn depend very much on situation. As a rule, the colors are not very bright, and a good portion of the leaves have fallen by the first week in November; sometimes, however, they maintain a leafy appearance until late in the month. All other species still retain more or less of their foliage; but, except some half hardy evergreen species, none of them hold their leaves so perfectly and with relatively so little change as a plant received from various botanic gardens as *B. Sinensis*, which is still bright green, although showing a little orange and yellow. The beautiful fruited *B. Thunbergii* has lost most of its leaves, which have been conspicuous during several weeks for their bright orange and scarlet coloring.

The fruit of *B. Sinensis* is very similar to that of the common Barberry, being very juicy and pulpy, and also shriveling and losing much of its brightness of color after several freezings. It is also of a much darker red color than the berries of *B. Thunbergii*, which are usually dry and tasteless, and remain bright, fresh-looking, plump and unshriveled throughout the winter. *B. Sinensis* is rather a plant of more slender and graceful habit than the common Barberry, and it differs strikingly from the compact and bushy form of *B. Thunbergii*, which is certainly much more desirable and valuable for strictly ornamental purposes. It is altogether probable that branches of the bright scarlet fruit of the latter will come to be much used as a substitute for Holly in Christmas and other winter decorations. The spiny character of the stems is against such use, but the tenacious clinging of the fruit to the branches which the species possesses is a very desirable quality. As with many other plants, the seed of this Barberry germinates more readily and quickly after being subjected to hard frosts.

Ilex decidua continues to hold all of its leaves in a bright and fresh condition, while those of *I. monticola* have all fallen, as has the foliage of *I. laevigata*, which turns to a clear yellow before it drops. The Black Alder (*I. verticillata*) does not assume any bright autumn color, and now more than half of its partly brown leaves have already fallen, leaving the bright red fruit more conspicuous than ever. There is a bright light yellow fruited form of this species which is well worth planting with the type to give variety and show contrast of colors.

The Japanese *Ilex Sieboldii* is another hardy species which is early deciduous, the leaves assuming a deep reddish purple hue before they fall. The fruit has not yet been produced in abundance here. Although small, the berries are of a deep, dark red color; and the plant promises to be of some ornamental value.

Arnold Arboretum.

J. G. J.

Quality in Apples.

"THE less definition, the more dispute." This statement must be regarded as an axiom of science; but when we set beside it the old proverb, "There is no disputing about tastes," how shall we approach the subject of this article? This approach must be made mainly from the practical, even the commercial, point of view. The nation's supply of fruit must be produced by its commercial fruit-growers; and as the great bulk of our people are in moderate circumstances, they must be supplied with fruit not too costly for their means. The choicest fruit is not, cannot be, for the multitude, because it cannot be produced in sufficient abundance, nor at a popular price.

Nevertheless, an abundance of fruit can be produced which has qualities good enough to insure a very large demand; and it is important that growers who mean to supply this demand should learn as much as possible about the marketable value of the different varieties.

Apples do not differ from other fruits in regard to this matter of quality, except in this, that very few fruits preserve their quality so long as our late-keeping apples. The buyer gets this class of apples nearer to its best than any other fresh fruit prominent in commerce. Most buyers of apples are in a way judges of the quality of the fruit, and within the limit of their pomological education they may be very good judges. But it is certainly a fact that our most popular apples are generally not the best for eating uncooked. Neither are our best dessert apples always the best for cooking. Nor is the public taste agreed upon a standard of excellence in regard to dessert apples. Beauty, as a confusing element, is to be considered. Handsome apples, even of quite inferior dessert quality, find a ready sale.

There is no apple so good that everybody likes it. In Canada and New England the Fameuse (Snow Apple) ranks with the first in popularity and price, and eminent pomologists allow it place among the first as a dessert fruit. Yet a pomologist in high station writes me that "the Montreal people may consider Fameuse a choice dessert apple, but it is certainly not so considered in the true apple-growing section." Yet Downing says, "It is an excellent apple"; Thomas says, "Much admired as a table fruit for its pleasant and refreshing flavor"; and not to quote further, the fact that it leads in favor for its season in so fastidious a market as that of Boston ought to have considerable weight in estimating its position. Esopus Spitzenburgh is frequently allotted the first position among later apples, but with all its high, rich flavor, its flesh is never soft or mellow, and some will grant it only the first place as a pie and sauce apple. The Newtown Pippin has long led as an export apple of dessert quality, yet many do not like it. Peck's Pleasant has been awarded the very highest position by connoisseurs, yet it has never attained wide popularity. Rhode Island Greening is a favorite of many pomologists, and is extremely popular; but it is only when yellow-fleshed that its merit is conspicuous. A green-fleshed Greening is always inferior. Yellow Bellflower is, when well grown, a superior apple, but otherwise is of little value. The same is to be said of the King of Tompkins, and indeed of very many sorts. Almost every apple-growing section has its apples of local celebrity, little known or esteemed elsewhere.

For the general market, long experience shows that there must be, with the keeping varieties at least, a union of both cooking and dessert quality to ensure general salability. Much more of this fruit is eaten cooked than uncooked, and an apple that will not make good pies stands at a marked disadvantage in the market. It must not only have a good flavor which will stand fire, but it must cook quickly and thoroughly; and an apple that will not answer this requirement can never be popular. The King, the Baldwin and the Greening are leading apples in market, because, along with ease of production, they possess this double utility. Cooking quality, therefore, is of as much importance as dessert quality. In determining the value of the great commercial apples it may, indeed, be said to lead.

The finest dessert apples are sometimes good culinary fruit, but most of them lose part or all of their excellence under the test of fire. So far, they may be regarded as inferior in the fruit market. Their place is on the fancy fruiterer's counter,

to be sold for exactly what they are—table fruit. Some of the very best, notably Pomme Grise, are almost excluded for lack of beauty and size. On the other hand, for apples for the street stands, where immense quantities are sold, beauty is of the first importance, and this, joined with moderate softness of flesh, is of much more consequence than high flavor. From one end of the Mississippi Valley to the other Ben Davis is the omnipresent apple; and much as its quality is denounced in the meetings of our pomological societies, its very denouncers plant it by the quarter section because it sells.

Fruit-growers who have been brought up on Ben Davis, and who have been forced to grow it against their will, are to be pardoned for some violence of feeling against apples of inferior quality; and I seem to notice that it is they who are the severest critics of the apples of north-eastern Europe. They will admit their beauty, as well as the hardiness and productiveness of the trees; but because among them merits equal to those of the Greening and the King have not yet been recognized, their patience will not hold out until time elapses for their careful trial and estimation. They rush into denunciation as a sort of relief, and kick them as a man kicks the cat when he is angry with his wife.

I do not think they are wise in this. Let patience have her perfect work. Of these apples of eastern Europe upward of 250 varieties have been imported and are now under trial. It is an immense task, and nothing but preliminary and tentative reports can yet be made by any one. I have been at work upon them for twenty years, and yet I am unacquainted with the qualities of four-fifths of them. In one-fifth I have found three sorts that I am planting for profit: one, the Yellow Transparent, for summer; another, Prolific Sweeting, for fall, and a third, Longfield, for early winter. A fourth, Bogdanoff, is plainly a keeper, but only this year have I obtained enough of these to give them a preliminary testing as to season and quality. Professor Budd, of Iowa, has the whole list under trial in the college grounds at Ames. From him I have lately received specimens of six large and handsome winter varieties which I am also subjecting to test as above. The fact is now established that all these apples are not early kinds. I trust that patience will be exercised in awaiting the careful trial, vitally necessary in the interest of the cold north, of these hardy, beautiful and productive fruits. They will not hurt anybody, and no one is going to gain any credit that he will not richly earn in the long, laborious and careful efforts needed to assign these fruits to their proper position in our pomological records.

Newport, Vt.

T. H. Hoskins.

Nematodes Again.

LAST year I made an examination of Coleus leaves to ascertain the cause of the serious blotching of the foliage, but nothing in the nature of a Fungus could be found. The knowledge of Nematodes obtained during the past year suggested a re-examination of the Coleus foliage for microscopic eel-worms. Upon thoroughly dissecting the first leaf-blotch a number of the worms were brought to light, and their presence was constant throughout the large number of leaves examined. Without attempting to identify the species, which, so far as general appearance goes, closely resembles the one on the Violet, Spinach and Chrysanthemum—namely, *Heterodermis radicola*—the fact remains, that the worms are there and seem to be the only observed cause of the blackening of the Coleus leaves and their premature falling. The light colored leaves are much more noticeably blotched than the dark red ones, but all sorts seem to be equally the prey of the worms.

Spots or blotches similar to those upon the Coleus were recently found upon all the leaves of a sickly specimen of *Lantana* growing out-of-doors. Upon examination for some *Cercospora*—for the spots appeared to have a mould upon them—it was quickly found that here again were the Nematodes. Every spot, large or small, contained many worms, and they were active in the soft parts of the leaf between the upper and lower epiderms. These spots, as those of the Coleus, were bounded quite regularly by the veinlets of the infested leaves, and it is probable that the denser substance of the veins may serve as a check to the spread of the worms throughout the leaf. The roots of the affected Coleus plants contain many galls, and in these the worms may be found in all stages of development. It is hoped that some helminthologist may find this branch of his subject—namely, Nematodes in leaves—of sufficient importance to warrant a study of it. There are many interesting questions that arise concerning the worms beside the extremely practical one that always

comes up from every gardener—namely, what shall be done for the trouble? Suspicion of Nematodes may well be aroused whenever leaves are brown in patches and otherwise green when no insect or Fungus can be found.

Rutgers College.

Byron D. Halsted.

The White-Flowered Perennial Pea.—English periodicals contain considerable information recently regarding this plant (*Lathyrus latifolius albus*) and its propagation by seed. Some writers assert that a large proportion of the seedlings come true—that is, with pure white flowers—from seed. Raising this Everlasting Pea from seed, however, means growing the plants on until the second year to test them as to their color, and this, no doubt, accounts for the high prices demanded in Europe for the plant. But it is surprising that one should go to the trouble of raising seedlings of doubtful color when the genuine plant may be easily propagated by means of cuttings. We have usually cut off the whole of the tops of the plants in fall, using two joints to each cutting, and have invariably found that seventy-five per cent. will root readily, grow rapidly and flower the ensuing summer. After the tops have been cut off, if desired, the root may be lifted and placed in a deep box in a greenhouse, where an abundance of young shoots will appear, and these, if taken off while short and stocky, also root freely. When this plant becomes better known and cheaper we may hope to see it frequently used as a screen plant, for these perennial Peas need support just as Sweet Peas do. They are out of place in a border, for they spread rapidly among other things, and the rain bespatters the flowers with dirt, marring their purity. But if the plant has a chance to climb, a little assistance at starting and good, deep rich soil, the result will be a revelation. One thing to be remembered is, that these Peas, in common with most leguminous plants, transplant badly, and an old plant to start with is not half as good as a young one. It takes a good deal of digging to lift an established root of this Pea, and when replanted the old roots need twelve months in which to become re-established.

South Lancaster, Mass.

E. O. O.

Young Fruit-trees.—We have never found a better way to judge of the bearing of young fruit-trees, and to decide whether they are bearing too little or too much, than to observe the length of the annual shoots. The treatment is then to be given in accordance with the result of this examination. If the growth is slow, mellow culture or fertilizers will be necessary. If, as generally happens, slow growers bear too much, thin out most or all the fruit when small, which will aid in giving the trees more vigor, and what little fruit there is will be worth more than the numerous small and scrubby specimens. Small growth and too much small fruit go together, and thrifty growth furnishes a few large and fine ones. If the annual shoots are not over a foot long in the early years of fruit-trees, more vigor must be given them. Nothing is better than top-dressing with barn manure late in autumn or early in winter.—J. J. Thomas, in *Country Gentleman*.

Correspondence.

Some Early Wild Flowers.

To the Editor of GARDEN AND FOREST:

Sir.—Although most persons think there are no flowers to be found in our New England woods or fields from the last of November to the first of April, they have been found in this neighborhood in every month in the year. For twenty months in succession, from April, 1879, to November, 1880, some wild plants were in flower near Boston. Colonel Higginson, in his delightful "Out-Door Papers," says: "The first wild flower of spring is like land after sea. The two which throughout the Northern Atlantic States divide this interest are *Epigaea repens* and *Hepatica triloba*." For many years I have thought they blossomed about the same time. The Mayflower does not grow in any quantity near Boston, so that I have not had the opportunity of watching it closely. But my favorite spot for *Hepatica*, in Middlesex Fells, is only six miles from Boston. When I first collected the flowers here I used to think myself fortunate if I found a good bunch of them on Fast Day. At that time a friend told me he had once found these plants blooming in February. After that, whenever I was near the place on a mild day in winter, I looked for them, and at last, on the 11th of January, 1874, I found several plants in flower, and one out of blossom, with only the involucre and seeds left, indicating that it blossomed in December perhaps. I found it in flower March 21st, 1878; March 7th, 1880; November 30th, 1881; November 30th and December 31st, 1884;

January 2d, 1885. On November 30th, 1886, I found a single plant in bud, and marked the place by breaking the top of a bush by which it grew, and on December 9th, after three or four cold days with the thermometer at about ten degrees, after a three days' snow storm, I found it in blossom under more than a foot of snow.

Since then, having removed to Malden, I have had a better opportunity to watch the plants, and have found them in flower eight months in succession. In 1889, October 20th, November 12th, December 8th; in 1890, January 2d, February 13th, March 30th, April 6th and 20th, May 4th and 7th. When I found it in flower in October I thought it must be earlier than the *Epigæa*, but a friend to whom I sent one of the flowers, in acknowledging the receipt of it, writes: "My sister found on the same day in early October the *Epigæa* and fringed *Gentian*," so that I am still in doubt, as one of the plants which I found on the 20th must have been in flower some days, the petals having fallen from all the flowers but one.

Since writing the above I have learned that the *Epigæa* was found in flower near Williamstown about the 19th of September, 1878.

Another of our early-flowering plants which has generally been overlooked is the *Ranunculus fascicularis*. This was in blossom in Middlesex Falls, November 10th and 12th and December 8th, 1889.

Malden, Mass.

E. H. Hitchings.

Recent Publications.

Hooker's Icones Plantarum, volume x., part ii., September, 1890.

This issue of *Hooker's Icones* is principally devoted to figures of new Chinese plants, and is of unusual interest. Several of the plants here first made known are important trees; some represent new generic types, while from the cultural point of view many of them are of special interest to us, as it is more than probable that the plants of western China will flourish in the middle and perhaps northern states as well as in many parts of central Europe. So far as hardy plants are concerned, west central China is the only great field of enterprise which is left uncultured, and the collector who follows in Dr. Henry's footsteps, with the view of introducing into cultivation the plants of the mountain region of western China, will reap a rich reward and perform a great service to horticulture.

A mere enumeration of a few of the plants here figured will serve to give an idea of the richness of this Chinese flora and of the treasures which await the enterprising collector: *Tilia Tuan* (t. 1926) is a tree described as forty feet high, with ample membranaceous leaves, covered on the lower surface with white stellate tomentum. The bark is used in making shoes. *Tilia Henryana* (t. 1927) is a tree described as thirty feet high, with leaves smaller than those of the last, and covered on the lower surface with fulvous pubescence. There is a third new Linden, *T. Oliverii*, from the same region where the Japanese *T. Miqueliana*, already introduced into cultivation from Japan, was also detected by Dr. Henry.

Professor Oliver proposes a new genus, *Tapiscia*, for a tree which he places provisionally in *Sapindaceæ* on account of the copious albumen of the seed, the presence of conspicuous stipules, and the resemblance of the leaves to those of *Euschaphis* and some other *Staphyleæ*, although the leaves are alternate and the ovary is unilocular and uniovulate. *Tapiscia Sinensis* (t. 1928), the only species, is a tree with leaves eight to fifteen inches long, with three to five leaflets, sessile panicles of small, regular, hermaphrodite flowers, and subglobose, dry, indehiscent fruit. The generic name is an anagram of *Pistacia*, which the dried specimens of this remarkable tree suggested to Professor Oliver.

Fraxinus platypoda (t. 1929), with curiously dilated petioles, is a new Ash described as twenty feet high. *Fraxinus retusa*, var. *Henryana* (t. 1930), is a form with broader leaflets of a plant previously known from Hong-Kong.

There is a new plant of the Witch-Hazel family, *Sycopsis Sinensis* (t. 1931), a genus previously represented by a single species collected many years ago in Khasia. *Cephalotaxus Griffithii* (t. 1933), a species previously known from upper Asam and Munnipore, is here first figured from Mr. Faber's Chinese specimens.

Schizophragma, a genus previously represented by a single Japanese species now a familiar object in gardens, is enriched by a second species discovered on Mount Omei by Mr. Faber, for which Mr. Oliver proposes the name of *Schizophragma integrifolia* (t. 1934). It is distinguished from the Japanese plant by its more coriaceous leaves, which are not cordate at the base, and by the narrower petaloid calyx-limb of the abortive ray-flowers, these being represented by the more conspicuous

rudiment. A curious form of *Fagus sylvatica*, the old world Beech-tree, characterized by very long leaf-stalks, is distinguished as var. *longipes* (t. 1936). In *Menispermaceæ* there is a new *Cyclea*, *C. racemosa* (t. 1938). *Populus lasiocarpa* (t. 1943), described as a good timber-tree, is common on the mountains at elevations of from four to six thousand feet.

Two new Blackberries are described, *Rubus malifolius* (t. 1943) and *R. simplex* (t. 1948), and a remarkably anomalous plant, for which a new genus of uncertain relationship, *Eucomia*, is proposed. The fruit and general aspect of the specimens suggested *Ulmaceæ* to Professor Oliver, but no trace of perianth could be found in the flowers dissected from the small axillary buds. The leaves are destitute of stipules, and "in the cell of the fruit, which survives and includes the solitary seed, there is always present a collateral or nearly collateral pendulous abortive second ovule." This remarkable tree, *Eucomia ulmoides* (t. 1950), which is cultivated in the districts of Changyang and Patung, was not seen by Dr. Henry in a wild state. It is of considerable commercial importance, being highly esteemed by the Chinese in their materia medica; and "the most singular feature about the plant is the extraordinary abundance of an elastic gum in all the younger tissues, excepting perhaps the wood proper—in the bark (in the usual sense of the word), the leaves, and petioles and pericarp; any of these snapped across and the parts drawn asunder exhibit the silvery sheen of innumerable threads of this gum." The bark, according to Dr. Henry's notes, "is the most valued medicine of the Chinese, selling at from four to eight shillings a pound. The tree is planted from the seeds and is cut down in the third to the sixth Chinese month and stripped of its bark. During the last twenty years the production seems to be diminishing from Cheshuan, from which it chiefly comes, and the price has increased four or five fold."

A number of interesting and a few handsome Chinese herbaceous plants are figured in this issue, which contains also several new plants, with one new genus, *Tisonia*, in *Boraginææ*, from South Africa.

Exhibitions.

The Boston Chrysanthemum Show.

THE complaint has been general that this has been a trying year for Chrysanthemums, and yet Boston never before saw such a magnificent array of well-grown plants as those displayed at the annual exhibition last week, and the cut flowers, especially those grown by Mr. S. J. Colman, equaled the plants in quality. The collection of flowers in vases, shown by Galvin Brothers, but also grown by Mr. Colman, made a noteworthy feature of the exhibition, showing the high decorative value of these large Chrysanthemum flowers when properly arranged in large vases.

The prize collection of twenty named plants was exhibited by Mr. Walter Hunnewell, and contained the following varieties, all superb examples of the most intelligent cultivation: Minnie Miller, Hon. John Welch, General Latimer, Empress of Japan, Marvel, Needless, Sachem, Cullingfordii, William H. Lincoln, Diana, Echantresse, Neesima, Mr. John Laing, Norumbega, F. McFadden, Kioto, Fair Maid of Guernsey, Lilian B. Bird, Duchess and Robert Bottomley.

The prize for a specimen plant of a Japanese variety was also awarded to Mr. Hunnewell. The variety shown was Mrs. Alpheus Hardy, and, even without considering the acknowledged difficulty in growing this variety well, it was a splendid plant. It stood five feet high in a twelve-inch pot, and at the top measured five feet in diameter. The head was literally a mass of snowy bloom, and each flower was of fine size, form and substance. Other prizes for plants in pots were awarded to Mrs. Francis B. Hayes, Dr. H. P. Wolcott, Nathaniel T. Kidder, Dr. C. G. Weld and the Bussey Institute.

A rather pleasing feature in this department was the general collection of plants from the Bussey Institute. Having been allowed to grow pretty much as they pleased, and arranged here with faultless taste, they showed that untrained plants have for decorative work a utility and charm with which formal specimens cannot compete. Two varieties, *Source d'Or* and *Minetto*, were especially attractive in this group. The former is a Japanese variety, with flowers of deep orange yellow tinged with bronze; the latter a pompon, in which the flowers are of a soft amaranthine purple. In these a single stem had been allowed to run up for some distance, and then a head was formed in the way of a standard. The branches were not trained in any way, and the weight of the flowers caused them to droop gracefully in a cluster on one side, thus forming a very pleasing picture.

The special award of a silver medal to T. D. Hatfield, Mr. Hunnewell's gardener, was an appropriate recognition of his skill as a cultivator of *Chrysanthemums*. A similar medal, and one equally well merited, was awarded to S. J. Colman.

The seedlings were numerous, but few of them were of sufficient distinctness and value to supplant old favorites. The Society's silver medal for the best seedling of 1889 was won by Arthur H. Fewkes with a variety named Beacon. It was a large loose flower, with petals incurving slightly and pure white. In the same class Mr. S. J. Colman was second with Albert Henry, a very large flower (fully eight inches across), of the Edwin Molyneux style of petal, but only slightly incurved, and nodding instead of erect, thus showing the centre conspicuously. Mr. James Wheeler was third with Mrs. Joseph H. White, a large flower, with petals inclining to a horizontal position, broad, white-margined and deeply tipped with pink. The Appleton medal was awarded to Henry A. Gane for seedlings, and Mr. T. H. Spaulding's seedling, D. D. Farson, received honorable mention.

Mr. George B. Gill exhibited a sport from St. Patrick (Beethoven), with pale yellow petals slightly tipped with red. It was of good form, and sufficiently full and distinct to deserve perpetuation. The poor lasting qualities of the flowers of Mrs. Alpheus Hardy were well brought out during this exhibition. Even upon the plant they do not stand like many other well known white varieties.

A silver medal was awarded to Richard Gardner, gardener to Cornelius Vanderbilt, Newport, Rhode Island, for a new hybrid *Calanthe*. This plant is the result of crossing *C. Veitchii* and *C. vestita rubro-oculata*, the latter being the seed-bearing parent. The flowers are much larger than those of either parent, and of a much purer white color than those of the latter, with large pale rose blotch at the base of the lip.

Boston.

B.

The Autumn Exhibition in Philadelphia.

THE exhibition of *Chrysanthemums* in Philadelphia last week was admirable for the size and vigor of the plants, for the abundance and perfection of the cut blooms, and for the richness, variety and distinctness of the seedlings displayed. It was so well balanced throughout that no special department deserves praise which should not be accorded in equal measure to all the rest, and it is difficult to characterize the show or any part of it without the use of superlatives. The arrangement of the plants in the large hall was very effective. The long tables of Ferns, Palms and other plants with a luxuriance of foliage not only helped, to soften the glitter of the flowers, but the collections themselves were of rare merit. The plants exhibited by Thomas Long, gardener to A. J. Drexel, contained many rarities, which were attractive in themselves and arranged with rare skill. Among the choice plants in this collection were specimens of *Heliconia aurea striata*, *Aglaonema pictum*, *Spathiphyllum pictum*, *Dichorisandra musaica* and *Livistona Sinensis aurea*. Hardly less interesting was the table of Palms, Ferns, etc., of Charles D. Ball, Holmesburg, Pennsylvania, which contained nothing but plants taken directly out of the nursery stock. Among them there were no expensive rarities, but their vigor and health and tasteful grouping made them very effective. The collection of the same class of plants grown for ordinary purposes by Mr. H. A. Dreer was equally meritorious, and the assortment of decorative plants by William Joyce, gardener to Mrs. Baldwin, was well worthy to be found in such good company. Besides these masses, the centre of the hall contained many noteworthy specimen Palms exhibited by Thomas Hughes, the gardener to George W. Childs.

But as this was a *Chrysanthemum* show the interest centered upon these plants and their blooms. Probably no one ever saw a better group of *Chrysanthemums* than those which took the prize for a collection of twelve plants in twelve varieties, and which were shown by James Verner, gardener to A. J. Drexel. These plants averaged more than six feet in diameter, and upon one of them 300 first-class blooms were counted. As a matter of record it may be well to give the names of this prize list: Miss Mary Wheeler, Grandiflorum, Robert Crawford, Mrs. A. Blanc, Robert Bottomley, Mrs. Frank Thompson, Mrs. W. Sargeant, Puritan, Lilian B. Bird, Mrs. Irving Clarke, Mr. Frank Wilcox. Every one of these plants were models in form and in natural gracefulness, in the perfection of flowers and the health of their foliage. Scores of other plants deserved special mention, but there was no question as to the superiority of this remarkable group. These prize plants were all grown with a single stem branching near the ground, and of course they are more difficult to grow than

where several shoots are allowed to come from the same root.

The blooms were shown in the small hall, which contained besides them some Roses and other decorations. Among the best of the decorations was a bank of Orchids, all well-grown and well-flowered plants, and most tastefully arranged by Mr. Evans, of Rowlandville. The twenty-five blooms of *Chrysanthemums*, one of a kind, which were shown by F. R. Sykes; the hundred blooms, one of a kind, shown by William Tricker, with the fifty blooms in fifty varieties, and fifty blooms in twelve varieties, both by the same exhibitor, were pronounced better than any similar groups ever before shown in this city. Some of the collections of cut sprays, especially a vase containing some half dozen blooms of Lilian B. Bird, were remarkably good. Twelve blooms of the new yellow Henry E. Widener, shown by Ernest Asmus, were noteworthy for their immense size as well as for their perfection of growth. The aggregate diameter of the twelve was said to be more than ten feet. The twelve varieties selected by Mr. Tricker for his prize lot of fifty flowers were John Collins, Lilian B. Bird, Eldorado, Dawn, Mrs. Wanamaker, Grandiflorum, Excellent, Miss Mary Wheeler, Kioto, Mrs. A. Carnegie and Etoile de Lyon. This is the first time the last named flower has been exhibited in Philadelphia, and although these specimens had not reached the size the flower is said to have attained in Europe, it attracted much attention for its good form and good color.

Among the winners of the principal prizes besides those already named were Coles & Whitley, Joseph Heacock, Hugh Graham's Sons, J. W. Colflesh, John M. Cleary, Henry B. Surman, John Shaw, Charles W. Trotter and E. A. Schneider. A special premium was awarded to Julius Roehrs for a new Hybrid Perpetual Rose and a certificate of special merit was given to E. D. Sturtevant for two unopened flowers of the rare *Aristolochia grandiflora*. The flowers at this stage have a striking resemblance to the figure of a swimming water-fowl, so that the common name of "Duck-plant" applied to this *Aristolochia* is quite appropriate.

Seedling *Chrysanthemums* were shown in large numbers, and some of very high quality. Some of the large growers do not seem to have as many novelties as usual, but evidently a constantly increasing number of persons are raising a few seedlings, and as a result we find each year some very valuable flowers of marked individual character, not only for exhibition kinds, but in the fancy varieties, of which the French growers have given us so many. The American raisers have been remarkably successful within a very few years in securing very distinct breaks and a number of varieties of very well defined character. The finely imbricated Chinese kinds for some reason have not been done well in the United States, the climate seeming, in the eastern states at least, to be unfavorable to them. Evidently we shall soon have a number of round incurved kinds fully equal to exhibition requirements, and we shall need to make a new class for such as Mrs. Isaac D. Sailer, with which Mr. W. K. Harris won the "Veteran Prize." "Japanese incurved" might be an appropriate name for the class. The flower is a perfectly incurved, flesh-colored ball, very full, and with somewhat narrow florets. Even the bush of these shown was furnished with flowers massive enough to grace the exhibition boards. Mr. John Thorpe was hampered by his distance from the exhibition hall, but his new seedling, George W. Childs, with its soft, rich crimson and large petals, will be enjoyed by many for its rare and much desired shade, as well as its satisfactory form. His reflexed seedling, Ernest Asmus, is quite unique—a bronzy chrome. Peter Henderson & Co. gained a silver medal for Annie May. This flower, which originated with Mr. J. Forsterman, Newtown, Long Island, is a very full primrose yellow, with a bright apricot centre, large and distinct, slightly reflexed. Mrs. T. Monohan had a number of good flowers, and prizes were given to Mrs. I. G. Whildin, a primrose yellow form of Source d'Or. Black Beauty, of the same grower, also had a prize. It is a deep, full crimson, with lighter reverse well incurved. Mrs. Louis Childs Madeira was a golden yellow Chinese incurved, with a most remarkable solidity, and if well grown it may possibly be very valuable.

Mr. W. K. Harris and Mr. Robert Craig each scored the same number of points on six plants of new seedlings, so nearly were the two fine collections balanced. Mr. A. H. Fewkes, Newton Highlands, Massachusetts, exhibited a few seedlings of promise. Waban, a rose-colored incurved, in the way of Mrs. C. W. Wheeler, was excellent, as was another, a small ball of sulphur yellow, with orange centre.

James Brydon, gardener to Mr. J. Simkins, Yarmouthport, Massachusetts, exhibited some perfectly grown blooms and seedlings, etc. E. A. Wood, West Newton, and H. A. Gane, of the same city, staged very satisfactory seedlings, as did H.

Tong, gardener to Mr. W. L. Scott, of Erie, Pennsylvania. His rose colored flowers, while not large, were distinct and pleasing. Curiously different were the airy blooms of the Massassanqua Garden, Erie, Pennsylvania, and the white Ben d'Or of this selection, very noticeable. Mr. T. H. Spaulding exhibited his valuable novelties which attracted so much attention and gained the prize at the Orange show. He had also Mrs. Frances Spaulding, a fine yellow sort, rich colored, light, but full. Scattered through the exhibition were many other seedling plants of sufficient merit to deserve a special description in almost any other company.

New York.

S.

Notes.

The Report of the proceedings of the Boston Convention of the Society of American Florists has been received. It makes an attractive and instructive pamphlet of 140 pages.

It seems curious to read in an Austrian journal that while herbaceous Pæonies are common in England, France and even Germany, they are scarcely ever seen in Austria except in one or two private gardens.

A correspondent calls our attention to the fact that a Ginkgo-tree in the garden of Mr. Robert Johnston, of Providence, has produced crops of fruit since 1887. This tree and its male companion were imported from France in pots in 1849.

Dr. H. Mayr, Professor of Silviculture in the University of Tokio, and author of an important work on the forests of the United States, will return to Europe during the coming year to assume a position in the forest-administration of Bavaria, his native land.

It is said that dried flowers of *Lilium bulbiferum* and *Hemerocallis graminea* are sold in Chinese towns, woven together in braids of some five inches long. They have local renown as a remedy for diseases of the lungs, and are also used by cooks to flavor dishes of meat.

Peter Kieffer, well known as the introducer of the famous Pear which bears his name, died in Roxborough, Philadelphia, on November the 7th. Mr. Kieffer was born in Alsace in 1812, and came to America in 1834. He built up an extensive business, and was widely known as a pomologist.

Some plants which are very susceptible to a chill in the spring when they are young become quite able to endure the frosts of early autumn. We have observed that several plants of *Cobæa scandens*, which cover porches on the south or east sides of a house, still hold their green leaves, and what is more, are showing an abundance of flowers in this latter part of November.

A correspondent of the *Illustrirte Gartenzeitung*, of Vienna, says that in a private garden, of which the exact locality is not given, there bloomed this year for the first time a Clematis of unusual color. It is a hybrid of two years' growth from seed, and the large blossom, more than four and a half inches in diameter, is of a uniform dark crimson, similar to the color of the flowers of *Rubus odoratus*.

The Botanical Garden at Prague, which contained a fine assortment of hardy as well as greenhouse plants, was totally ruined by the great flood which in September last swept away the famous old bridge over the Moldau. For four days the water lay two feet deep above the greenhouses and plantations, and in the lowest parts of the arboretum it remained for ten days, to the entire destruction of almost all the plants.

In commenting on the formal style of gardening which he was so largely instrumental in driving out of fashion, Horace Walpole amusingly says: "In the garden of Marshal de Biron at Paris, consisting of fourteen acres, every walk is buttoned on each side by rows of flower-pots, which succeed in their seasons. When I saw it there were 9,000 pots of Asters or *La Reine Marguerite*—that is to say, what we now call China Asters."

Mr. W. J. Green, horticulturist of the Ohio Experiment Stations, in the summary of his report on Raspberries says that the Black Cap varieties now considered the most reliable are: Gregg, Hilborn, Ohio, Palmer. The red sorts that succeed best generally are Turner and Shaffer; the best for shipping are Brandywine and Marlboro. Muskingum, Royal Church and Thompson's Early Prolific are the most promising of the newer varieties.

According to the New York *Tribune* the increase of grape production in California has by no means decreased the amount of our importations from foreign lands. On the con-

trary, while twenty years ago not more than 500 barrels of grapes were annually brought from Spain, this year there will have come from the one port of Almeria alone no less than 180,000 barrels of the fruit. The importations are sold by auction, and bring from \$3.50 to \$16 a barrel.

The autumn colors of trees and shrubs are so striking that we sometimes overlook the herbaceous plants which add splendor to this season. *Lysimachia clethroides* is something of a weed, but just now a mass of it cannot fail to arrest attention by the rich crimson and yellow of its leaves. The little blue Plumbago, too (*Ceratostigma plumbaginoides*), which was covered until frost with its deep blue flowers, now makes a carpet of crimson deepening into maroon. This is a good plant for half shady places, where some low-growing thing is needed to cover the ground.

A German horticultural journal recently spoke with high approval of the so-called "American Giant Cyclamen," *Dodecatheon Clevelandi*, which, it said, would for the first time be offered to the trade this year by American nurserymen. It is not a Cyclamen, of course, but has gained its popular name from the fact that its large violet-blue flowers, with yellow and black centres, somewhat resemble Cyclamen flowers in shape. It is a native of California, discovered about three years ago, and is a hardy perennial which thrives best in rather shady localities. It bears from six to ten blossoms on a leafless scape about fifteen inches in height.

Worlidge, an English horticulturist who wrote in the year 1677, suggested that the name "Guelder-rose" (still commonly applied to the Snowball, *Viburnum opulus sterilis*) was not improbably a corruption of "Elder-rose," as the flowers of this *Viburnum* resemble those of the Elder. Some modern etymologists have adopted this explanation, and it seems supported by the fact that the name is perhaps more often written "Gelder-rose" than "Guelder-rose." But others derive the term from an old belief that the flower first came from Guelderland in Holland, and point as evidence to the Dutch name *Geldersche-roos* and the French *Rose de Gueldre*.

An article in a recent number of the *Gardeners' Chronicle* says that the demand for trees for planting has vastly grown of recent years and promises still further to increase in the future. One firm of nurserymen, whose establishment, which is yearly being enlarged, lies not far from Carlisle, now annually plants out more than two million seedling Larches, between two and three million Scotch Firs, one million Spruces, the same number of Corsican Pines and of Austrian Pines, a hundred thousand Douglas Firs, and millions of Thorns, Beches, Sycamore Maples, Ashes and other hardwood trees. This stock is eventually distributed not only through Great Britain, but through the United States, Canada and the various colonies.

We have elsewhere shown that it is important to give the children of our public schools some elementary instruction concerning trees, and especially the native trees which grow all about them. It is an encouraging sign that lectures on trees and forests now form part of the exercises at teachers' institutes in many places. Mr. Fernow not long ago addressed an audience of 600 teachers at Norristown, Pennsylvania, and this will doubtless inspire a great many familiar talks by a number of these teachers to their pupils. Miss Graceanna Lewis, of Media, Pennsylvania, is prepared to give to schools or private classes a course of four lectures on Oaks, Maples and Beeches, with original illustrations showing the form, size and color of the leaves of each species. The multiplication of such influences and efforts is greatly to be desired.

In the October number of the *Illustrirte Gartenzeitung*, of Vienna, under the caption "The new *Magnolia Fraseri*," we read that "this novelty" bloomed last spring in Philadelphia; that a specimen of it stands in Bartram's garden, in that town, and two others in Germantown, and that one of the latter "yearly blooms in profusion, but has not yet ripened seed." It is true that *Magnolia Fraseri* is not often seen in cultivation, and for this reason the Philadelphia specimens (which show it to be hardy far northward of its native habitat) are of interest to horticulturists. But it is hardly correct to describe as "a novelty" a *Magnolia* which was discovered by Bartram in 1776, was introduced by him into England in 1786, and was sent by the elder Michaux to France in 1789. Readers of the *Gartenzeitung* may easily be misled into thinking it a genuine novelty of perhaps Japanese origin. Its true home is in the southern Alleghany Mountains, and especially along the streams which flow from the Blue Ridge, the Black and the Big Smoky Mountains. It is there called the Mountain *Magnolia* or the Long-leaved Cucumber-tree.

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Form in Flowers.

COLOR, form, size, habit and fragrance—these are the characteristics which, varying from flower to flower, produce in their different combinations the myriad types that delight us. Fragrance, however, may be set aside just now as not appealing to the sense of sight; for it is this sense which judges of beauty, and it is of the beauty of flowers that we intend to speak. And especially of beauty as shown in cultivated plants and modified by the hand of man.

The fact has been noted in these pages that the average eye is more impressed and attracted by beauty of color than by beauty of form. To combine colors well needs, it is true, the most highly cultivated taste; but the appreciation of single tints or of gradations of one or two plainly harmonious tones is a not unusual gift. Form, on the other hand, is seldom thoroughly appreciated except by trained eyes. In consequence, although the judgment of florists and their patrons is sometimes at fault in matters of color, it is in matters of form that it oftenest goes astray.

One of the facts which prove this statement is the constant confounding of mere size with beauty. In everything which appeals to the eye—from trees to churches, from jewels to mountains, from pictures to rosebuds—size is a potent element in arousing interest and admiration, its appeal to the sense of wonder being constantly confounded with an appeal to the sense of beauty. There are many cases, of course, when it is a true æsthetic factor, rightly augmenting delight. Other things being equal, an immense church interior or a huge diamond is more beautiful than a small one. All occidental men would doubtless give a similar verdict with regard to trees. Yet are not the Japanese now acknowledged to be a people of finer artistic sense than our own? And a Japanese art-critic in America has replied, when the small size of certain New England trees was excused, that to care for the bigness of trees was "barbaric"—their form was the primary, their size but a secondary consideration. But, however it may be with trees, it is certainly barbaric to lay too much stress on size

in flowers. When Nature herself makes them large she adapts shape and details to size. She draws their outlines with a bold hand, usually builds them of solid substance, gives them a massive array of pistils and stamens, and sets them on plants with sturdy stems and broad, firm leaves. Look at the Magnolia, the Night Blooming Cereus and the Artichoke if you would see big flowers as Nature loves to design them. There are exceptions to the rule, and Nature occasionally sets a big blossom on a small plant, but we instantly recognize the fact, and are more impressed by the oddity of such plants than by anything else about them. The best guide for man's efforts at improvement is always to follow the rule of Nature, not to imitate her exceptions. She can be graceful even when working with emphatic contrasts; but it is easier for him to succeed when he keeps to obvious harmonies.

There is a class of plants, just now very popular, which illustrates how gardeners may go astray in their improvements. These are the Tuberous Begonias. Differing much in the size of their leaves, these plants are naturally of low habit, with such weak flower-stalks that the blossoms droop, and with small flowers of somewhat irregular outline—that is, the type, as Nature designed it, was a small, drooping, irregular flower. The aim of the gardener, however, is to make it large, regular and erect. There are countless splendid "improved" Begonias in cultivation now, but the more one looks at them the more one feels that—apart from the variety of beautiful colors they show, to which all admiration is due—their cultivators have wasted their time. The increased size of the blossoms makes them look too large for the plants; their irregularity of outline and want of symmetry, so charming in smaller flowers, are displeasing on a larger scale, giving almost the effect of malformed flowers rather than of such as Nature had intended to be unsymmetrical; while the greater erectness of the blossom had destroyed its grace without giving it real dignity. But we are told the ultimate aim of the cultivator—true erectness and perfect symmetry—will soon be achieved. And if so, what will be gained? A commonplace-looking flower, with characteristics similar to those of a dozen others, in place of an individual, peculiar type that will have been "improved" out of existence. Big regular blossoms, holding their faces "well up," will undoubtedly be more "striking," but they will no longer be Begonias for any one who, beneath a name, cares to find a distinct floral type.

Of course, too, these Begonias are being doubled, and with their doubling the last traces of their identity will disappear. But it is almost hopeless to protest against this, the most common sin of cultivators. Who, that cares for types as expressions of Nature's creative power, and who that has any eye for beauty of form, can look with patience on the fashion which converts the exquisite cup of the Daffodil into a ragged lump of yellow, which mars the curve and fills the hollow of the Tulip's bowl with crowded petals, which "improves" the bell of the Hyacinth until it is no longer a bell, and the four-pointed star of the Bouvardia till it is no star? How, one wonders, has the Lily-of-the-Valley so long escaped, and when will Nature's beautiful half doubling of the Water Lily be carried further, until the last of the golden stamens disappears? And may not a "full double" Iris be the next high priced novelty? Nothing, indeed, seems too dreadful to anticipate, now that Narcissi are advertised for their close resemblance to double Camellias, and the ruined form of a Tiger Lily, dubbed *flore pleno*, decorates the pages of the latest plant-catalogues. Double Azaleas we have long had with us, and double Snowdrops. And if the shape and habit of the Begonia are to be utterly changed, will not some one make the Cyclamen hold up its head and spread out its petals in an orthodox way?

We do not wish to imply that there are no flowers which may well be doubled, that increase of size should never be aimed at, or that habit of growth can never be improved. It is only to protest against excess and misdirection

Form should be a prime consideration always. It should not be confounded with symmetry; and yet the truth should be remembered, that certain sorts of irregularity, charming on a small scale, are ugly when increased size makes them more conspicuous. A weak habit is often a defect to be remedied, yet at times it constitutes the whole character, grace and beauty of the plant. The multiplication of petals may often produce an effect so different from that of the natural flower as to constitute a new type, and one of much beauty. The type of the Dahlia has not been ruined by doubling—it has been replaced by another type with a certain formal beauty of its own. But such doubling often does no more than spoil the first type by turning it into a shapeless mass like that of many double Narcissi. Even double Roses should not be so big and so solid that neither grace of habit, nor beauty of general outline, nor freedom in the disposition of the petals remains.

The Jesup Collection of the Woods of the United States.

ON Saturday, November 15th, the "Jesup Collection of the Woods of the United States" was formally opened to the public in the Museum of Natural History in this city. For several years past the specimens have been shown in the great hall on the ground floor of the old part of the building, but much of its space was occupied by other collections, so their arrangement was not advantageous, nor could the drawings which accompany them be displayed. Now, however, the Jesup Collection alone occupies this hall, space for the other things having been found in the new wing of the Museum; and the public can appreciate the full interest and value of the wood specimens themselves and of the accessory collections which explain the trees that produced them and thus vastly enhance their significance. The old hand-book (which is shortly to be revised for a new edition) named 412 species of trees native to our country. All these, with one or two exceptions, are represented among the woods, and a few additional specimens have been secured since the hand-book was printed in 1885. Almost all the specimens are as fine, as regards both size and condition, as could be desired, and those which are less perfect will eventually be replaced by better examples. While each specimen shows the natural aspect of the tree with its bark, the character of the wood is shown in the upper portions by longitudinal, horizontal and oblique cuts, one half of each exposed section being plain and the other polished. The value to architects and artisans of the products thus displayed can only be realized by one who has passed the long rows of logs in review, and seen how many, as yet unfamiliar to commerce, show great beauty or singularity in color and marking. Information with regard to the strength of each wood is given, moreover, by the results of mechanical tests and chemical analyses recorded on the label-card, where also the scientific and popular names of the tree are given, while its habitat is shown on a little map. These labels, contrived for this collection by Professor Sargent, to whom Mr. Jesup entrusted the formation and arrangement of the collection, received a prize at the Paris Exposition last year and have since been imitated in at least one European collection.

Next to the woods themselves the most important feature of the collection is the series of large water-color drawings, representing the leaf, the flower and the fruit of each species in their natural sizes, which have been painted—in every case directly from nature—by Mrs. Sargent. About two hundred and fifty of these drawings are now shown, and the completion of the series is promised for the near future. As attractions for the popular eye they may outrank the wood specimens themselves, for they illustrate the beauty and immense variety of our forest-foliage and blossoms in a very charming and artistic way. Yet their value to the botanical student will be equally great, for although much freer and more graceful in treatment than the usual botanical illustration, they are absolutely truthful and exact. One point of excellence deserves especial notice. This is the way in which, although only isolated leaves and flowers or flower-clusters could be shown, the habit of the tree is suggested. The specimens are posed, to use the only available word, as nearly as possible as they would show in nature, so that we see at a glance not only the aspect of leaf and flower, but the manner in which the tree bore them.

To supplement these paintings we are promised a series of large photographs illustrating the chief species of our trees as

they grow in their native home—a feature which again will delight the public, and will be of incomparable value to the landscape-gardener and the horticulturist. Of extreme interest, too, is the series of glass cases filled with examples of the way in which insects devastate our trees, the insects and their nests being carefully prepared natural specimens and the leaves upon which they are feeding being most skillful imitations. The same persons have been engaged upon these who prepared the collection of stuffed birds shown in their natural haunts which was presented to the Museum by Mrs. Stuart a few years ago.

It is impossible, of course, in a brief notice like this to explain the great interest which the Jesup Collection has for every student of Nature; but enough has been said, we think, to suggest, at least, its practical value in a number of different directions—to the engineer, architect and artisan, to the forester, horticulturist, landscape-gardener and botanist, and to the mere lover of Nature's works. There is no collection of the kind in Europe which is so complete and instructive as this one; and we think it may safely be said that there is none of any kind, scientific or artistic, in our own country which equals it for many-sided completeness.

About 1,200 persons were present at the opening on November 15th, and as many as the lecture-room could hold afterward listened to the first of this year's series of lectures by Professor Bickmore, of the Museum. The subject of this was, appropriately, "The Broad-leaved Trees of the American Forest," and it was illustrated by admirable pictures of forest-scenes and remarkable trees. No better engine than the Jesup Collection, especially if explained from time to time by free lectures of this description, can be imagined for the diffusion among our people of an accurate knowledge of our forests and a true love for them. Nor is there any subject with regard to which an increase of popular interest and information is just now more greatly to be desired.

A Slaughtered Giant.

OUR illustration on page 575 shows a *Sequoia gigantea* with choppers at work inside the cleft cutting their way through the trunk. This is not a tree of the first size, being less than twenty-five feet in diameter and about twenty at the point where it was cut. In point of beauty and symmetry it was one of the best of the surviving Big Trees. It stood until a year ago in the Tule River forest, Tulare County, California, and was sold by the private owner of the land to certain persons who wished to exhibit it. The plan was to take a section of the trunk, hollow it out to a shell and then divide it into convenient and portable pieces, so that it could be carried about and set up as a show. The project fell through, however, for lack of funds, and the section of the slaughtered tree never got beyond Visalia, in the county where it stood. It is now stored in that city. Let us hope that the original owner of the tree and its destroyers may some day realize that it will never again make such an exhibition of grandeur and grace as it did while towering above the spot where it began life as a seedling a thousand years ago.

The Sequoia Forests of the Sierra Nevada.

THE following paper was read by Mr. Frank J. Walker before the California Academy of Sciences on September 1st and published afterward in *Zoe*. Since that time the Tulare Reservation Bill has become a law, but it is not generally known that the Government still holds other forests of Big Trees which are quite as worthy of protection as those already included in reservations. Mr. Walker's paper places on record many facts concerning which every citizen of the United States should be informed, for these wonderful groves belong to the people of the East as truly as they do to the people of California. It was a laudable sentiment which made it possible for Congress to pass without opposition the act to rescue one of these groups of Sequoias; but, as Mr. Fernow stated to a Senate committee, there are economic considerations which demand with greater urgency that the protection of the Government should be given to many other forest-covered areas in these high mountain regions, because the water question cannot be solved without first solving the forest-question.

The accompanying map (page 573) gives the Sequoia forests as located by Mr. Walker. The squares represent

townships six miles square. Taking the estimates of the paper the amount of Sequoia forest in the reservation is 3,500 acres; the Government still owns 5,500 acres; the Government holds 4,500 acres which are otherwise claimed, while 24,000 acres have passed from Government ownership. The map also gives the boundaries of the Yosemite Reservation as lately extended. The reason for such extension, as may be plainly seen, is that it includes the sources and courses of the streams which find their way into the valley, and this will enable the Government to protect these waters from being destroyed or diminished or diverted to other use before they reach the valley.

In the Standard Guide Book to the Pacific Coast, of a late issue, we read this statement: "There are nine groves of Big Trees in California;" and in the descriptive sketch following this remarkable statement we find three of the nine groves mentioned as lying south of King's River, vaguely described as: The King's River grove, the grove in the basin of North Tule, and the grove in the basin of South Tule. There are in the localities named as containing three no less than seven distinct groves and forests of Big Trees, while in the enumeration given there is no mention whatever by the author of the several groves and forests of Middle Tule, Kern or Kaweah Rivers, nor of the most southern grove, on Deer Creek; in short, the omissions comprise some twenty distinct Sequoia groves and forests, aggregating an area of at least 25,000 acres. Few, indeed, of the inhabitants of Tulare County, where most of the forests are found, have any conception of the wide extent of their Sequoia possessions; probably not one person in 500 knows of the existence even of Big Trees on the Kern River slope, and many would dispute the fact—a fact I have never seen referred to in print—and yet there are no less than 2,000 acres in that region, and some of it the most dense forest-growth of *Sequoia gigantea* known to man. And so with other groves; many of them are to the general public practically unknown and unexplored.

It is my purpose in this paper to briefly mention what may be termed the forests of Sequoia, and the neighboring groves; and in making the distinction between forests and groves it will be necessary to draw a somewhat arbitrary line, and for this purpose we will classify as forests all areas of 1,000 acres or upward, and all below that as groves. According to this distinction we can safely assume that all forests of *Sequoia gigantea* are to be found to the south of King's River, and nearly all of them in Tulare County; and, with mere mention of the better known northern groves—the Calaveras, South Park, Tuolumne, Merced, Mariposa, Fresno and Washington—we will therefore confine our sketch to a description of this region only.

The first, going southward, and probably the largest compact body of all, is the Converse Basin Forest on the south slope of the South Fork of King's River, in Fresno County. The area of this tract is about 5,000 acres. These figures can at best be but an approximation. For most part the Sequoia country is so broken, and the variation of density of growth so great, and the limits so vaguely defined, that an exact estimation is almost impossible; besides, it is likely to be misleading from the fact that it represents, in some instances, what might be called a heavy continuous growth, while in others it is more or less broken and scattering. In nearly all cases there is found mixed with the Sequoia a plentiful growth of other timber, principally Yellow and Sugar Pine (*Pinus ponderosa* and *Pinus Lambertiana*), with a sprinkling here and there of Fir, Cedar and other trees. However, I have aimed everywhere to keep my estimates of areas well within bounds. This first forest, together with the one next in order, are owned by one of the leading lumber firms of California. And they are about to celebrate at Sanger the completion of their forty-mile lumber flume connecting their capacious mills in the mountains with the railroad on the plains. They propose to clean up everything as they go along, stripping the land bare, and moving their mills and extending their flume from point to point as the timber supply becomes exhausted. It will probably take years for them to reach the Boulder Creek Forest, so named from the affluent of King's River, on whose slopes it is found. The area of this forest and neighboring groves cannot be less than 1,500 acres, probably more. These two already mentioned lie together on the waters of King's River, in Fresno County, but the forest next to the south, the Fresno Big Tree Forest, is on the divide between the waters of King's and Kaweah Rivers, partly in Fresno and partly in Tulare Counties. Its original area cannot be computed at less than 2,000 or 3,000 acres, but so much of it has been stripped

of its timber that its limits are hard to determine. Here have been the principal milling operations in Sequoia for the past twenty years. Four sections of it, containing what is known as the "Fresno Big Trees," have already been reserved by the United States Government, it being the only reservation ever made in these southern forests for the purpose of saving the Sequoia. This is the reservation recently confirmed by the Honorable Secretary of the Interior, and containing the famous Big Tree known as "General Grant," said to be forty feet in diameter.

Passing on to the west side of Township 14, Range 28, we find along Redwood Creek a forest of some 3,000 acres. This most magnificent growth has also passed from the possession of the Government to private ownership. Farther south, we next come to a forest on the North Fork of the Kaweah River, where there are upward of 1,500 acres of Big Tree forest still owned by the Government. The whole township is timbered and well worth preserving, aside from the Sequoia.

A few miles southward brings us to the Giant Forest, which, although still in the hands of the Government, is claimed by individual locators, by reason of their locations having been made in good faith and filed previous to the withdrawal from entry of these townships, as explained hereafter. It is generally thought that they will substantiate their claims and acquire the land, and public sentiment seems to favor it. Passing to the Middle Fork of Kaweah River, we find several groves, some of which are still in the hands of the Government, but there exists on this branch no Sequoia tract that could properly be called a forest.

Southward, on the East Fork of the Kaweah River, we come to what is designated as the Mineral King Forest, from a mining district of that name, comprising, with the detached groves, some 3,000 acres; the main body is in Township 17, Range 30, the township whose recent restoration to entry gave rise to the movement culminating in the Vandever Sequoia Park Bill, lately passed in the lower house of Congress. In December, 1885, Commissioner Sparks, of the General Land Office, withdrew from entry eighteen certain townships, of which this was one. The reason for this suspension was the alleged fraudulent character of the surveys. We need not consider the condition of these surveys; but, from the character of the country, it would seem that the subdivision lines could be more readily run with a ruling pen than with chain and transit; and at that time the compensation for either system of survey was supposed to be the same. But one thing is certain—on many of the Government plats you will search in vain for any trace of Sequoia growth, even where the alleged lines run through sections now known to be heavily timbered with the Mountain Redwood. It is to this fact largely, no doubt, that the very existence of certain Sequoia forests has so long remained unknown to the public.

The fact that several of the suspended townships contained Big Trees had nothing whatever to do, so far as we know, with influencing the act of the Commissioner. But Commissioner Sparks "built better than he knew," and the ultimate outcome of his order of withdrawal has been to preserve, in the Government's undisputed possession, several forests of these Big Trees that would otherwise have gone the way of all the rest into the hands of speculators and lumbermen. Thus the matter remained in statu quo till the opening of the present year, the friends of Sequoia preservation resting easy in the fancied security of their position, inasmuch as the Department had expressly declared its policy not to restore to entry these lands in advance of an official examination. At the opening of the present year, parties interested in acquiring timber by some means secured the release of the suspension of Township 17, Range 30. It was restored to entry on May 23d, and in less than six weeks the entire Mineral King Forest was filed on by timber-land claimants, and the tract effectually cleaned up. While thus the greed for Big Tree timber was developing the supply was growing short, and the attention of timber prospectors was turned to other forests, and it was found that in the next township to the south there was a forest practically unexplored that offered the best field for their next work. The same measures that had proved so successful in opening up Township 17, Range 30, were forthwith set to work to secure this more valuable prize. At this juncture a few citizens of Tulare County took steps to thwart the attempted spoliation of the Sequoia forests. As the forest in Township 18, Range 30, was the one the timber men most wanted, the inference was reasonable that it was the best of all for the Government to keep. The ultimate outcome of its opposition has been the Vandever Bill, embracing in the proposed reservation two townships and four sections

to be set apart as a National Sequoia Park. This reservation includes the forest marked on the map as the Sequoia Park Forest, and also the larger part of the Homer Peak Forest, somewhere from 3,000 to 5,000 acres.

South of these, following the Sequoia belt, we come to the Dillon Mill Forest of over 1,000 acres, with but little remaining to the Government, and from which thousands of Sequoia fence-posts are being hauled this season. And still farther southward, partly in the south-east corner of the same township, and extending into the corners of three other townships, is the Tule River Forest. Much cutting and slashing for a period of years has here been going on; and during this time different mills have been drawing their supply of Mountain Redwood from this forest, and still by far the larger part remains. Here exists a noted centre of Sequoia growth known as the "McFadyen 80" (acres), estimated by lumbermen to have on it timber sufficient for 8,000,000 feet of lumber. Only one mill is running this season. This, with the Pixley Grove, we will estimate at 3,500 acres. About six miles directly south is the Putnam Mill Forest containing some 4,000 acres. A portion of this, that in Township 20, Range 31, is still owned by the Government, and is a very beautiful forest of over 1,000 acres. Next comes the Fleitz Forest, owned by a Michigan syndicate; to the south of which are groves owned by the syndicate known as the "Kessing," the several tracts comprising an area of some 4,000 acres. Here again, in the south-west of Township 22, Range 31, the Government possesses a forest of somewhat uncertain value and extent, known as the Indian Reservation Forest, and estimated at 1,500 acres. It is not generally known that there exists any Sequoia on the Kern River slope, but there are on that side at least 1,500 or 2,000 acres in groves scattered along the slope from Freeman's Valley southward for some fifteen miles. Only one of these tracts could be classed as a forest, that of Freeman Valley. Here is a tract of about 1,000 acres, a limited portion of which is probably the heaviest growth of *Sequoia gigantea* in the world. Unfortunately this also has passed into the hands of lumbermen. One grove more remains to be mentioned, not because of its intrinsic merit, but because of its location, it being, so far as known, the southernmost limit of Sequoia. It is that on Deer Creek, indicated on older maps as "Mammoth Grove." It contains less than 150 Sequoias, scattered over an area of perhaps 300 acres.

This completes the list. The Sequoia forests proper therefore extend over a belt of country beginning at Converse Basin on the north and ending with the Indian Reservation Forest sixty miles to the south. The groves and forests together in this region are upward of twenty in number, with an average distance between them of perhaps three or four miles.

Within this scope of country, a moderate estimate of the Sequoia area would be, according to the foregoing figures and including a few unnamed groves, 37,500 acres, divided between the several river systems as follows:

King's River.....	7,500
Kaweah River.....	14,000
Tule River.....	14,000
Kern River.....	1,700
Deer Creek.....	300
<hr/>	
Total acres.....	37,500

It has been sufficiently shown that there are in the state several forests and groves of Big Trees still belonging to the Government aside from those embraced in the Vandever bill. To ensure the safety of these, and to put them beyond the designs of timbermen, and, above all, to protect them from devastating forest-fires, it is exceedingly desirable that they be reserved and placed under expert supervision. We need no reminder that the greed of timber and cattle men will soon work havoc with what remains unless something be done to stay the devastation; and if we would save a portion we must begin at once.

Concerning the utility of the region embraced in these limits as the best natural reservoir for the storage of waters needed for irrigation we need not dwell. But for a moment let me touch on the suitability of the country for a park because of its charming natural attractions. You need hardly be reminded of this. The heart of the Sierra culminating in Mount Whitney affords grand scenery of peculiar charm and great variety. Here are three Yosemite's rivaling their noted prototype in many features, with a little world of wonders clustering around the headwaters of Kern, Kaweah and King's Rivers. We will simply mention the Grand Cañon of the Kern, where, for twenty miles, the mad waters of the river are walled in

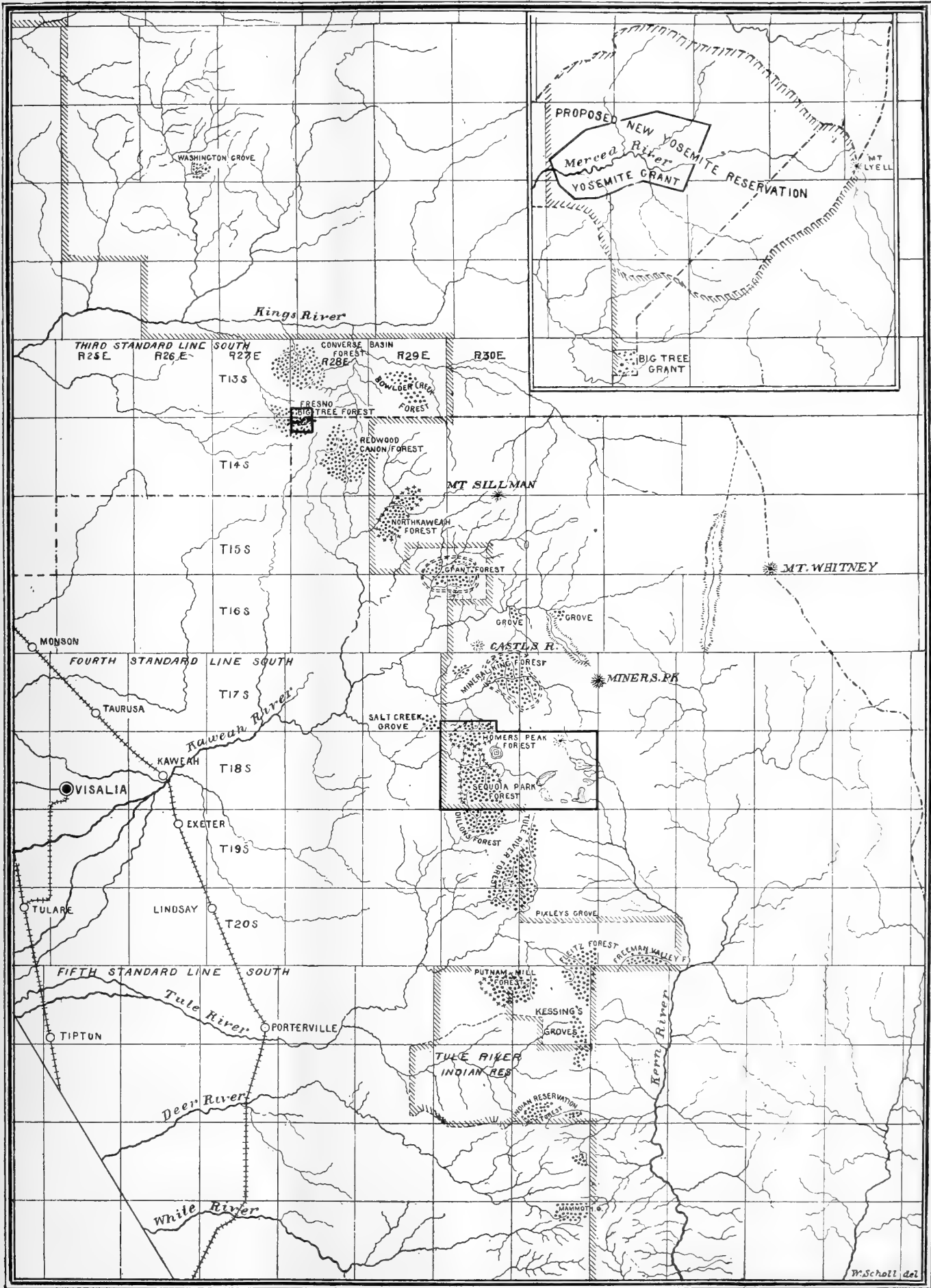
with the continuous battlements of the California Alps, crowned with nameless and unnumbered domes and towers. Then, only a few miles across the divide, extends the cañon of King's River with its wealth of impressive scenery, and some eight miles farther to the north lies the valley of Tehipitee—the gem of the Sierra—with its wondrous dome of rock rising in rounded majesty some 6,000 feet from the level of the river-cleft meadow at its feet. Yet a view of the most impressive and characteristic scenery of the region is to be earned by scaling one of the lofty peaks of the Kaweah Range. At least a hundred peaks here rise to altitudes exceeding 10,000 feet. One never can forget the impression who has once looked out over the California Alps from the pinnacle of Miner's Peak. As I once before said, in describing this scene: "Here amid the companionship of peaks one beholds with speechless wonder the spectacle beyond. No satisfactory view of the Whitney Range can be found from the San Joaquin plains. The intervening Kaweah Range veils the view of the higher peaks beyond. But here, standing on the crest of the Kaweah Sierra, one looks across the Grand Cañon of the Kern, and the encircling wilderness of crags and peaks is beyond the power of pen to describe. Mounts Monache, Whitney, Williamson, Tyndall, Kaweah and a hundred nameless peaks—the crown of our country—have pierced the mantle of green that clothes the cañons below, and are piled into the very sky, jagged and bald, and bleak and hoary—a wilderness of eternal desolation."

Plant Notes.

Some Recent Portraits.

THE November number of the *Botanical Magazine* contains a figure of *Acineta densa* (t. 7143), a magnificent Orchid from Costa Rica, belonging to the tribe of the Vandas, and related to *Lueddemannia* and *Peristeria*. It produces pendulous, dense-flowered racemes of large, pale golden yellow flowers. This is not a new inhabitant of gardens, having been introduced into England as long ago as 1849. It is still, however, rarely seen, although one of the showiest of all the plants of its class.

There is a figure (t. 7144) of *Eucharis Bakeriana*, a native of Columbia, and related to the well known *Eucharis Amazonica*, or, as it should be called, *E. grandiflora*. Another of the bulbous species of Iris (*I. Sindjarensis*, t. 7145), allied to *I. Caucasica*, *I. orchidoides* and *I. Palæstina*, is figured. It is a dwarf plant, with crowded, lanceolate, broad, distichous leaves and pale lilac flowers, discovered in 1865 in Mesopotamia by Dr. Hanskenecht, and introduced into cultivation by Max Leichtlin, of Baden-Baden. There is a figure of the dwarf variegated Bamboo (*Arundinaria Simoni*, var. *variegata*, t. 7146) best known in cultivation as *Bambusa Simoni*, a native of Japan, and introduced many years ago into the garden of the Paris Museum by one of the French Consuls in China, Monsieur Simon. It is a hardy, tufted plant, reaching in Europe a height of eight or ten feet and flowering sparingly. "In Algiers it is described by Rivière as forming rhizomes that bury themselves one and a half to two feet, and from which new culms rise in the beginning of May, which, during the first year, are simple, clothed with spathaceous sheaths, and attaining twenty to twenty-five feet in height. Toward the end of the second year these culms ramify in whorls from above downward and flower. The leaves are eight to ten inches long and quite glabrous." The specimen which served as a subject for the illustration is "from a magnificent plant grown by Mr. Paul in a Camellia-house at Cheshunt, the culms of which are fourteen feet high and as thick as the thumb"—a suggestion of the best way this plant, as well as many other species of the dwarf Bamboos, can be used in our northern states in decorative gardening. There is a figure of the well known *Pereskia aculeata* (t. 7147), a member of the Cactus family, and one of the first of the tropical plants introduced into Europe, it having been cultivated in the Royal Gardens at Hampton Court as early as 1696. In Kew, it appears, it has been cultivated ever since the foundation of that establishment, although there is no record of its having flowered there until last year. It is a straggling or climbing bush or small tree whose branches are described as climbing, but more generally it climbs by means of the hooked spines of the young branches. The flowers are an inch and a half in diameter, with pure white, rosy or yellowish white petals. The fruit is the size of a small gooseberry, globose, transparent, few-seeded and covered with small spreading leaves, the free tips of the sepals. The leaves are used as a pot-herb in Brazil and the berries are eaten in all parts of the tropics of the New World.



The Big Tree Forests (*Sequoia gigantea*).—See page 570.

As the editor points out, "It is singular that so common an American plant with an edible fruit should not have been introduced by the Spaniards and become an 'escape' in the Old World, where I think it would be naturalized with great rapidity."

The colored plate in the *Revue Horticole* of the issue of November 1st is devoted to the Mexican *Senecio Ghiesbreghtii*, a native of Mexico and an extremely ornamental species, which is now often seen in the gardens of southern Europe.

Foreign Correspondence.

London Letter.

TREES IN TOWNS.—Dr. M. T. Masters, editor of the *Gardeners' Chronicle*, lectured recently before the Royal Horticultural Society on the subject of Tree-planting in Towns. An enormous amount of material and labor are or have been wasted by planting indiscriminately all kinds of trees and shrubs, most of which prove incapable of enduring the atmosphere and other trials inevitable in town streets and gardens. The right thing to plant and the manner of planting are unknown to vestries and local boards, and many of these bodies have already learned by sad experience how ignorance, when it dabbles with planting, must inevitably come to grief. Dr. Masters' lecture will be published in the *Journal* of the Royal Horticultural Society. It will include an exhaustive list of such trees and shrubs as have proved to be adapted for cultivation in towns. It would be interesting to us to have the results of American experience in this matter.

PERNETTYA MUCRONATA.—Are American gardeners acquainted with the pretty berried varieties of this plant, which were raised in an Irish nursery about ten years ago? The type is, of course, well known everywhere as a first-rate hardy shrub which bears an abundant crop of bright crimson berries every winter if happily situated. Mr. Davies of the Hillsboro Nurseries, County Down, has added considerably to the value of this plant by raising from it a number of varieties remarkable for the rich colors of their berries. White, pink, lilac, purple, cerise and almost black berried varieties were obtained, and these are now becoming popular, not only for the open border, but as pot-shrubs for winter decorations in-doors. Plants a foot high, compact as Box and thickly laden with berries may be grown in a five-inch pot, and such plants are as attractive as any berry-bearing plants in cultivation. Out-of-doors the plants sometimes fail to produce berries, that is in some gardens. In Mr. Davies' nursery I saw acres of them about seven years ago, and every plant, from babies six inches high to large bushes as tall as a man, was a mass of fruit. It is probable that a sandy, peat soil is most conducive to fruit-production in these plants; such, at any rate, is the character of the soil in Mr. Davies' nursery. Variegated conifers were much better colored in this nursery than I remember to have seen them elsewhere. In Ireland the *Pernettyas* are almost as commonly grown for winter effect as *Solanum Capsicastrum*. The varieties are named Alba, Carnea, Purpurea, Macrocarpa, etc., names which are descriptive of the berries. They are now trying in America, if this has not been done already. [*Pernettya mucronata*, like other plants of the southern Hemisphere, is not hardy in the northern states.—Ed.]

CHRYSANTHEMUMS.—There will be over fifty large exhibitions of Chrysanthemums held in England during next week. The National Chrysanthemum Society will devote four days to a gigantic exhibition, conference, etc., to mark the centenary of the introduction of the Chrysanthemum into England. In most of the parks and public gardens of London special efforts are annually made to produce an imposing show of this most popular of all winter flowers. Kew, Finsbury Park, Victoria Park, Temple Gardens, with several other places of popular public resort, have each an exhibition of no mean order. The literature of the Chrysanthemum crops up everywhere at this time of year, daily papers, society papers, papers of every description commenting upon, discussing and offering advice on the management of the hundreds of varieties now cultivated. No flower, not even the Rose, has ever been more generally cultivated and admired in England than the Chrysanthemum is now. The taste for large, well formed flowers, combined with bright colors, which now prevails in England, was recently very much laughed at by the President of the Japanese Horticultural Society when on a visit to Kew. The perfection of Chrysanthemum culture in Japan is a large bush bearing an enormous number of small flowers. Such kinds as *E. Molyneux*, *Elaine*, *Avalanche* and *Mrs. G. Rundle* would not, he

said, find any favor with Japanese growers. In my opinion the finest Chrysanthemum ever raised is *E. Molyneux*. It is almost a miracle in form and color. Nothing in horticulture is more remarkable than the development of such a flower from the little yellow buttons of the progenitor of garden Chrysanthemums—namely, *C. morifolium*.

SALVIA SPLENDENS and *S. azurea*, var. *grandiflora*, are most useful plants in the greenhouse at this time of year. The rich scarlet flowers and bushy habit of the former are as effective as anything we have, whilst the bright blue flowers of *C. azurea* are charming amongst the commoner colors which prevail in the greenhouse in November. At Kew about a dozen species of *Salvia* are grown out-of-doors all summer along with the Chrysanthemums, and housed at the same time. The treatment that is good for the one is equally good for the other. These two genera and *Celosia pyramidalis* are the most striking features of the conservatory just now.

CATTLEYA WAROCQUEANA.—Better acquaintance with the plants distributed under this name and a comparison of their flowers with those of some of the forms of *Cattleya Gaskelliana* has led to the conclusion that the latter name must stand for both. In the time of flowering, the character of the pseudobulbs, the form of the flowers and the wide range of variety in their colors, there is no marked difference between what was introduced and distributed by Mr. Sander seven years ago as *C. Gaskelliana* and this new introduction of M. Linden's Company. At the same time, there are amongst the latter forms which differ from anything previously seen in what was introduced by Mr. Sander as *C. Gaskelliana*. We are indebted to M. Linden for additional proofs of the exceptional value of this sub-species as a garden plant. Some of the flowers recently exhibited by M. Linden showed a close resemblance to *C. speciosissima* (*Luddemanniana*).

ODONTOGLOSSUM CRISpum.—There is apparently no danger of this Orchid ever becoming extinct as a wild plant, for it must be as abundant on the mountains of New Grenada as the Primrose is in the copses of England. Hundreds of thousands of plants are imported into England every year, and they may be bought at the auction rooms at seventy-five cents a dozen. Ever since the year 1863, when the three collectors, Weir, Blunt and Schlim, found themselves sailing in the same steamer on the same errand, namely, to collect plants of *Odontoglossum crispum* for the Horticultural Society, Messrs. Hugh Low & Co. and M. Linden respectively, this Orchid has been imported in enormous quantities annually. What has become of the millions of plants thus poured into European gardens? At first many were killed by growing them in a stove temperature, but even now, when the conditions afforded under artificial treatment are the best possible, there are not in cultivation many examples of *O. crispum* that measure a foot in diameter. Is this plant naturally a short-lived one? Auction sales are not always the best means for stocking one's Orchid houses. The farming of Orchid grounds where the plants are wild enables the "farmers" to select the best varieties before the plants are dispatched to England or other countries to be sold as "unproved." On this side the best growers send to the auction rooms all the varieties that are not considered worth growing, keeping only those that are of good quality. It therefore follows that the beginner who returns from the auction rooms with "good established plants, bought for a few pence each," has got only the refuse of other collections. Of course they are Orchids all the same, and worth what they cost. Good varieties are costly in spite of the abundance of the plants in the market.

Kew.

W. Watson.

Cultural Department.

"Very Good" and "Best" Apples.

WE who are and have been working upon our cold northern border to extend the culture of tree fruits successfully into the region of hard winters occasionally feel, when we read the criticisms of some who are recognized as experts in pomology, that our labors are not thought of very great worth to the country at large. I have sometimes thought that perhaps some prejudice entered into the criticisms we meet with; and I have to console myself with recollections of the kindness with which such work was recognized, even in its small beginnings, by such noble leaders as Downing and Wilder. The former showed his strong recognition of the importance of these experimental labors when he bequeathed his pomological library and notes to Professor Budd; while, as for myself, nothing gave me more encouragement than the receipt, four years since, of a letter from Mr. Wilder in

which he said: "You are doing the country great good by publishing the results of your experience in the growth of fruits on our cold northern border line." Of course, I felt that the plural form of the pronoun rightly embraced and included such men as Gibb, Tuttle, Jewell, Sias, Gideon and numerous others; some of whom, though doing much good

where such fruits are not required. The criticisms they make are natural enough from their point of view; but they emphasize them so persistently, and with so little real acquaintance with conditions and circumstances, that they partake of the character of assaults, and tend to discourage where Downing and Wilder saw good reason to encourage experiment.



Felling one of the Big Trees (*Sequoia gigantea*).—See page 570.

work, have not contributed as much as might be wished to the written record thereof.

At this time, however, I only desire to say something that has been impressed upon my mind by the frequent complaint made by certain pomological writers in regard to the quality of iron-clad tree fruits. These writers, without exception, live

The charge against the iron-clad apples as being deficient in dessert quality is true, and it is not true. It is true, just as the same criticism made by Englishmen against American apples is true. It is not true just as these English criticisms are not true. By this I mean that we are shipping to England a good many apples that do not approach in fine dessert

quality the best and most carefully grown among the choice table apples of Europe. But the English public buys and pays good prices for some of our poorest American apples. The Ben Davis, even where it is most at home and is well grown, is scarcely "good" for eating out of hand, yet for shipment to England it stands among the first in point of demand and in price. The Baldwin at its best, as grown in south-western Maine, is perhaps the apple first in demand for trans-Atlantic export; yet I never heard or saw the Baldwin named in a list of our best dessert apples, while the English experts think less of it than its American critics. "Its size, color and keeping quality are what sells it" is the verdict upon both; and the Rhode Island Greening, in its best form (yellow fleshed), though far superior to the Baldwin, hardly equals it in price, either at London or Liverpool. Northern Spys and Kings stand higher, but do not touch or approach the standing of the best Newtown Pippins.

Not so many as ten of the iron-clad Apples are well known outside of the region where they are chiefly grown. They are generally judged upon the character of the Alexander, the Red Astrachan, the Oldenburgh and the Tetofsky. When we ask critics of these apples what they mean by the poor quality of the Russian or iron-clad Apples, they invariably refer to these. Yet Astrachans, Oldenburghs and Alexanders are very salable apples in all our large markets. The Wealthy is never referred to, but the Wealthy is better than the Baldwin. The Prolific Sweeting is unknown or ignored, yet no fall sweet is its superior in appearance, or in quality for dessert or baking. St. Peter, Switzer, Longfield, Winter St. Lawrence, Shiawassee, Gideon's Peter have been grown long enough to be easily had for testing, yet they are not named. But they will all rank with the sorts that stand uncontested as "very good" or "best."

But how many of these "best" dessert apples are on record in American pomology, which scores altogether more than a thousand named and described varieties? Let us take the American Pomological Society's select record of 369 varieties and count them. There are just twenty-one of them, and the odd one is foreign. In the "very good" list there are 155 varieties, of which twelve are foreign and five are iron-clads, leaving but 132 apples in this class of our native apples outside of the native iron-clads. In all, then, of our American named apples (including Canadian varieties) there are but 142 that are ranked above the humble "g" which marks our culinary fruit of this class.

Our native iron-clads, then, are not below the average of the Society's select list. As to the Russians, no grade is yet assigned to any of those recently admitted to the record. This shows it to be the opinion of the Society that the time has not yet come to fix their place. That is precisely the opinion held by those who are most interested and have had the longest experience with them. As the students of these apples take this position, why should those of less experience and knowledge regarding them be in such a hurry to give judgment against them? Of the whole list no American, unless it be Professor Budd, knows the exact season or value of twenty of the iron-clads of north-eastern Europe.

Newport, Vt.

T. H. Hoskins.

The Root Rot of Salsify.

DURING the past two years gardeners have complained of much decay in Salsify roots. Before the crop is harvested some of the plants will be seen to have a pale yellowish appearance and soon the further growth of the top ceases. In the worst cases all of the plants are a mass of rottenness long before the time for harvesting comes.

An examination of the roots shows that the decay usually begins at the lower end of the main root and quite rapidly works its way up to the crown. The decay is particularly soft, very complete and somewhat offensive. In the decayed portion there is little left of the structure of the root, excepting the scattering vessels and woody fibres, which, having thick walls, resist the corroding action of the agent of decay. No threads of any Fungus are to be found in recently disorganized tissue, but thin sections of the decaying substance of the root reveal under the microscope great numbers of bacteria. The first effect of the germs is to dissolve the substance that holds the cells of the root tissue together. After this they penetrate the wall of the cell and increase so rapidly as to literally fill the infested cell with these minute bodies, each in constant motion. A view of such a cell under a high power of the microscope suggests the activity one may see in a bee-hive during the best week in honey-making.

Inoculations were made of the bacteria upon the healthy tissue of other roots, and the infection spread from each point

with remarkable rapidity. Other kinds of vegetable substance were treated in like manner, and it was found that all of the following were susceptible, but not to an equal extent: The fruit of the Egg-plant, Sweet Potato, White Potato, Onion and Apple. The egg-plant was entirely decayed in thirty-six hours, and the apple least affected. The progress of the decay of the various substances was in the order in which they are named above.

As to the beginning of the decay in the Salsify-roots nothing can be said but the decay as found when well under way is not attended by any insect or any Fungus, save the bacterium, which latter is constantly present in the decaying tissue, and small portions of this decaying substance are able to convey the activity to healthy tissue of the same host and to representative types of vegetables, fruits, tubers and other roots.

What needs to be done in the way of a remedy it is not easy to say. As the trouble probably begins below ground, and some distance from the surface, it is difficult to detect the presence of the trouble at the outset. The paling of the herbage should suggest an examination of the root, and if it is found decayed the plant should be dug and destroyed. It is not likely that any fungicide can be sprayed with good effect upon the plant. It is possible that large quantities of manure in the soil may have furnished breeding ground for the bacteria of decay. It would therefore be well to test the value of some commercial fertilizer upon this crop. As the decay is remarkably contagious, care should be exercised in discarding all roots at harvesting, and it should be borne in mind that the virus is active upon other similar food substances.

Rutgers College.

Byron D. Halsted.

Carludovicas.

THESE form a handsome genus of foliage plants, which, from their general appearance, give the impression of being Palms, though in reality they belong to a division of the *Pandaneæ*. The Carludovicas are of free and rapid growth when under congenial conditions, and are deserving of more extended recognition as decorative plants than they have yet secured, for they are not only highly ornamental as stove or conservatory specimens, but may also be used in an out-door foliage bed during the summer, provided they are not exposed to the full force of the sun. Of course it would not be a wise measure to take a Carludovica from a close, warm house and plant or plunge it out-doors for the summer without any further preparation, as the result would probably be unsatisfactory; but if treated as all foliage plants should be treated before they are planted outside—that is, if they are gradually hardened off by means of increased light and ventilation—they may be used for out-door decoration with very pleasing effect and without injury to themselves.

In-doors they prefer an open, well-drained soil which contains a fair proportion of peat, and when the plants are well established an occasional watering with manure-water is beneficial and tends to keep up the color of the leaves. Carludovicas are propagated by division, as most of the varieties sucker freely, or by means of seeds, when these are available; but as the seeds are seldom offered the first-mentioned method is that most generally adopted.

Among the varieties in general cultivation, or rather, most frequently met with, as none of them are particularly common, *C. humilis* is the best. It bears leaves of rich light green color, one to two feet long and nine to eighteen inches wide, and deeply cleft or bifid at the apex, making a shapely plant, bearing some resemblance to a Licuala, though without the thorny leaf-stems of the latter. *C. humilis* is possibly somewhat more tender than the following sorts, and some discretion should therefore be used in regard to its out-door exposure.

C. palmata is another handsome plant, with large palmate leaves that are deeply divided into narrow segments, the entire leaf being dark green in color. The leaves of this species are thrown up on long foot-stalks and have a very graceful effect. *C. palmata* also has some reputation as the plant from which the so-called Panama hats are said to be made. The young leaves, cut for this purpose, after having passed through various processes of steeping, bleaching, etc., are split into narrow strips and then plaited into hats.

C. rotundifolia is also a fine decorative plant, with general characteristics similar to the preceding sort, though the plants are quite distinct, as close examination will show. *C. rotundifolia* has fan-shaped leaves of a bright green color and deeply cleft into narrow pendent sections. It is not quite so large a grower as *C. palmata*, the latter sometimes attaining a height of twelve to fourteen feet under favorable conditions, while *C. rotundifolia* seldom exceeds six to eight feet.

One of the oldest species of this genus is *C. atrovirens*, a plant that deserves its specific name, for the deeply bilobed leaves, as well as their foot-stalks, are of an extremely dark shade of green. The leaves of this species are gracefully arched, and from a distance have some resemblance to the foliage of a *Curculigo*. *C. atrovirens* is a free grower, and usually produces a number of suckers around the base of the parent plant, so that its increase is a comparatively easy matter, and as the foliage of this sort is quite hard it makes a useful plant both in-doors and out.

In addition to the few species here mentioned there are some others in cultivation, of which one, *C. purpurata*, is somewhat similar to *C. atrovirens*, but differs from it in having reddish purple leaf-stems in place of the dark green ones of *C. atrovirens*. Another fine variety of more recent introduction is *C. Plumieri*, which makes a very handsome plant, but it is not so easily obtained as most of the above mentioned species.

Holmesburg, Pa.

W. H. Taplin.

Variation in Color of Chrysanthemums.

The Garden (London) of November 1st contains an interesting communication from Mr. Edward Molyneux, the well known grower, as to variation in form and coloring of Chrysanthemum flowers. Mr. Molyneux is a close observer of this family of plants, and his notes, always interesting, may usually be accepted without question. His conclusion in this article, however, "that the whole cause of the variation of color lies in the date the buds are formed" is not entirely correct. It is, of course, well known to every one having experience in cultivating the Chrysanthemum that the buds formed and selected at different seasons will produce forms and colors sometimes almost radically different from each other, and, as a matter of fact, crown-buds of most varieties produce flowers almost always differing in some respects from the terminals in form. Mr. Molyneux's conclusions might be correct as to color variations if only plants grown under usual greenhouse conditions were considered, and perhaps he had plants under glass, as usually cultivated, in mind when writing the article. But there are other conditions of culture, and any one who has grown these flowers, either under shade or in the open, must have observed that besides the difference in the time of bud formation more or less light is an important element in the coloring of many varieties, especially those of lilac and red shades. Persons having greenhouses with imperfect or not very clear glass will often notice a fading out or lightening of some colors, but this difference becomes much more marked when the direct rays of light are entirely excluded, as under a temporary canvas or other covering so often used. Having grown fine lots of flowers under a temporary tent, and others in a sheltered south border practically in the open, though with some overhead protection, I have been interested in noting the colorings of the various varieties under these two extremes of exposure. My experience under glass has been so slight that this will not be considered.

The variety Puritan seems to have been first exhibited in England this year, and its varied colorings excited some comment and were the immediate cause of Mr. Molyneux's note, and he explains that "the early formed buds give blooms characteristic of its name, . . . later buds give the deep lilac color sometimes seen; . . . both colors are sometimes to be found early in the season, for the reason that this variety is an early flowering sort, and although both kinds of bloom can be had at the same time and from buds of different dates, those earliest formed require longer to develop from the bud stage." That is not the nature of Puritan with me at least. My early flowers of this variety in the open were a full lilac; they were after covered, and all color disappeared except a slight trace on the lower petals. Those from later buds under the tent are of the purest white with no trace of lilac, and this has heretofore been the rule with this flower in that position; if grown near the edge of the tent there is usually a faint flush of lilac on the lower petals.

Admiration is a beautiful old variety if grown under cover, with a white centre, shading outside to a delicate pink. In the open, regardless of any time of bud-forming, it makes flowers of a turbid blue-red and is entirely destitute of any beauty. Madame C. Audiguier seems to be a freaky variety, which has sometimes run counter to my experience with other varieties, for I have had it well colored under cover and nearly white in a sheltered corner, but fully exposed. The effect of shading is not visible on the whites or yellows usually, though it slightly lightens the latter and clears out flesh tints as in Domination. It is in some forms of red that I find flowers are more seriously affected. Val d'Andorre, Lord Byron and flowers of similar

character are apt to be streaky and off color no matter when buds are taken. The favorite variety, J. Collins, is not seriously affected, though it loses some of the metallic tints so characteristic when grown in the open. An early bud which I picked to-day was richly colored in remarkable contrast to flowers from later buds, which, under the same shelter, have only developed a peculiar tan color. All of which, of course, serves to prove that different conditions and different cultivation in the garden produce different results. Among the Chrysanthemums one can find infinite pleasure, from early spring till the last flower is withered, in watching the different phases of these wonderfully varied plants. It is not surprising that the Chrysanthemums, single varieties of which have such chameleon-like habits, are growing constantly in favor of cultivators.

Elizabeth, N. J.

J. N. Gerard.

Notes from a Wild Garden.

THE showy Lady's Slipper (*Cypripedium spectabile*), to which repeated reference has been made in GARDEN AND FOREST, is rarely seen in cultivation. This neglect can probably be accounted for in the main by the limited areas in which it is found, that it is nowhere abundant and that it rarely bears fertile seed. But a little experience I have had seems to indicate that it may be readily propagated. Five or six years ago I introduced a plant to my garden. The first year it sent up but a single stem; but the stems have since been increasing at the rate of about one a year, and the past season there were five, all of which flowered, two or three bearing two flowers each. A division of the roots (which might have been made sooner to advantage) would of course now multiply them indefinitely. The plant, in the first place, was given a prepared soil of rich leaf-mould in a damp and partially shaded situation, and carefully mulched each successive year.

The corm of the Green Dragon (*Arisæma Dracontium*), of which mention was made in former notes, was reset the last season, as before, in a rich damp soil, and made a most remarkable growth. The terminal and principal leaf measured eighteen inches across, the leaflets all gracefully drooping with their own weight. The rigid upright stem, three-quarters of an inch in diameter near the ground, was over two feet in height and bore a second well developed leaf. The plant never failed to attract attention for its oddity. Of fair size when first introduced to the garden, it has been increasing in size each succeeding year. The corm the last season measured three inches in diameter or about the size of the mouth of a tea-cup.

To whom has it ever occurred to cultivate the Wood-Nettle (*Laportea Canadensis*) as an ornamental plant? And yet it only awaits a trial to prove to any one its effectiveness as a decorative plant for certain positions in the garden. Its merit was discovered to me only by an accident. In removing another plant from the woods some of the roots of the former remained in the soil, which, springing up, were allowed to grow, and for several years past it has formed a singularly effective clump of rich green foliage about four feet high. The ample leaves are still larger, the stems are taller and the foliage much increased by cultivation, and the great, spreading cymes of the strange-looking greenish flowers—the striking feature of the plant—are also much enlarged. It is enough to say a plant that will force the question from the most casual observer, "What is it?" is a success and needs no further commendation, and such is the Wood-Nettle in cultivation. Give it a rich soil in a damp, shady spot, and all it asks is to be let alone.

Fairview, W. Va.

W. E. Hill.

Notes on Shrubs.

A FEW plants of the Heath family are well known for the beautiful effects of autumn foliage which they assume. While some species have valuable characteristics of this kind it does not follow that all the species of any genus have any similarity in their manner of autumn coloring and defoliating. The foliage of many of the Blueberries and Huckleberries assumes bright red, crimson or orange colors in the late autumn, and it often persists much longer than the bright hued leaves of a majority of plants of other genera.

In the latter part of October and the early portion of November the High Blueberry (*Vaccinium corymbosum*) often exhibits splendid coloring which is hardly surpassed by the Sumachs, whose leaves fall much earlier. Although the common Low Blueberry (*V. Pennsylvanicum*) often brightens the waste places which it covers it is not so satisfactory under

cultivation that it could be recommended as an effective under-shrub in late autumn. It is valuable simply for its fruit, which is the staple and earliest Blueberry of northern markets. The leaves fall quite early, a habit which appears to be possessed by the alpine and very dwarf *V. cæspitosum*, and also by *V. Canadense*, which in some respects is very similar to the Low Blueberry. The leaves of the northern Bog Bilberry (*V. uliginosum*) are also quite early deciduous. The Deerberry or Squaw Huckleberry (*V. stamineum*) apparently loses its leaves without taking any bright colors. It is almost impossible here to get perfect fruit or seed of this species because of some small lepidopterous larvæ, which live within the berries and destroy them before they are fully ripe. The rare and edible-fruited *V. hirsutum*, from the mountains of North Carolina, is as beautiful in the richness of its autumn coloring as *V. corymbosum*, and it also has the merit of retaining its leaves until those of nearly all other deciduous species have fallen. The true Huckleberries (*Gaylussacia resinosa* and *G. frondosa*) hold their leaves well and they also assume pleasing purplish and orange colors.

The Sorrel-tree or Sour-wood (*Oxydendrum arboreum*) is hardly surpassed by the Flowering Dogwood in the depth and richness of its autumn foliage, but the leaves drop easily, and the plants here are leafless comparatively early in the season. Many of the leaves of the Stagger-bush (*Andromeda Mariana*) hold until quite late in November, and are often quite brightly colored; and perhaps no deciduous species in the whole family is more showy than *Leucothoe racemosa*, with purple, scarlet and orange foliage, which persists throughout the month. Although the flowers of this plant are of no ornamental value it is nevertheless a desirable one for planting in shrubberies and other situations where very late autumn color is a desideratum. It is easily cultivated, and once established it slowly increases and spreads by underground shoots. The beautiful flowering *Andromeda speciosa* retains its leaves in a fresh appearing condition quite as late as *L. racemosa*. Many of them gradually become yellowish, but there is no display of color.

Among the hardy deciduous Rhododendrons or Azaleas there appears as a rule to be little very attractive and constant character in the late color of the foliage. Some of them become purplish or reddish, others dull yellow or brown. The beautiful flowered *Rhododendron Vaseyi* possesses handsomer autumn foliage than any other, as it first turns purplish and later to a deep crimson, and generally persists well into November. The leaves of its nearest American ally, the Rhodora, gradually dry without coloring, and leave the plants leafless quite early in the season.

Arnold Arboretum.

J. G. J.

Potentillas.—It may be a help to those who know this bright, free-blooming family of summer-flowering perennials to have a short list of some of the best and most distinct varieties. There may be others quite as good, and I should be pleased to know of them through other correspondents. All the varieties enumerated are double, as the single ones, although very bright, are not nearly so lasting. The foliage of all the Potentillas have a close resemblance to that of the Strawberry, to which it is nearly allied. The flowering season is during the summer and early fall. Gloire de Nancy, golden yellow, large, full flowered; Jane Salter, orange shaded with scarlet, medium size, free; La Vesuve, bright red fringed with yellow, very double; Mars, dark velvety red, very free flowering; Perfecta, maroon shaded with lemon, very distinct variety; Wm. Rollinson, dark reddish crimson, splashed with orange, the freest flowering variety of all.

Norwood, Mass.

C. H. Rea.

Correspondence.

The Lake Scenery of Central New York.

To the Editor of GARDEN AND FOREST :

Sir.—The policy which you have often advocated of establishing a state board of trustees empowered to acquire and hold for public use and enjoyment tracts of interesting scenery, suggests a means whereby a most valuable feature of the lake scenery in central New York might be preserved. The rocky gorges through which flow the tributaries from the surrounding hills into these lakes still retain much of their original beauty, although the regularity of the water-flow has doubtless been materially changed by the clearing off of trees about their sources, and the frequent inroads made upon those which border these ravines upon either side. In spring the water rushes down in full streams, so that strongly supported bridges are needed to withstand their power; but as the season

advances the channel becomes nearly or quite dry and in places exposed to the sunlight, while the more shaded portions are kept moist by springs along the hill-side, the waters of which filter through the soil and drip from the rocks. The timber in some instances has been removed entirely from the less precipitous slopes, which, if available, are cultivated; but where they have proved too steep or rocky for cultivation a new growth of trees is struggling to reoccupy the land.

From the summits of the hills that slope toward the lakes a very extensive view may be obtained, in which the trees that follow these water-courses are a most conspicuous and beautiful feature, comprising as they do a large variety of deciduous trees, interspersed with Pine, Hemlock and Red Cedar in considerable quantity, and the combination presents those inimitable shades of color which are only found in a wood of Nature's planting. These evergreens, growing down as they frequently do to the shore of the lake, are not less to be prized in the winter landscape.

Though holding, perhaps, a second place to the trees in importance, the loveliness seen by those only who penetrate these sequestered glens is surely worth preserving. The configuration of rock, as well as the verdure with which it and the soil are covered, vary so much in each one, that no matter how many of these glens we visit, each one has a charm as fresh as if no other one existed. Cascades are frequent, and the sound of falling water, either near or distant, makes constant music in almost all of these ravines. Ferns and Mosses follow the shade and moisture over rocks and hill-sides, growing out of crevices where no soil is visible. The little *Asplenium trichomanes* forms with the finer Mosses pretty mosaics on the rugged surfaces. The curious Walking Fern, *Asplenium rhizophyllum*, has a good footing in one locality, but is rare in others. As these and many other tender plants are now found only where shade and moisture are uninterrupted, it follows that if the timber is destroyed they must go with it, leaving bare rocks as a rule where now they are the exception.

Any intervention on the part of the public to stay the destruction of this beautiful as well as useful scenery would, of course, be unnecessary if the possessors of this natural inheritance realized its value; but as many of them do not, it is only by concerted effort on the part of those who do that any positive and hopeful step toward its preservation can be taken.

Klinger Lake, Mich.

Dorcas E. Collins.

The Trees of the City of Washington.

To the Editor of GARDEN AND FOREST :

Sir.—No city in the country is so well supplied with well-planted and neatly kept public grounds as the national capital. This is largely due to the fact that the planting of the streets and most of the parks is under one management, thus permitting unity of design and effective treatment. Among the points of interest to be noted in the management of these grounds are the following :

1. The removal within the past few years of most of the fences surrounding the parks.

2. The planting of entire streets with trees of one species. For example, Eleventh Street, for its entire length of two miles, is lined on both sides with Sycamores; Fourteenth Street with Soft Maples; Sixteenth Street with Tulip-trees; Massachusetts Avenue with Lindens.

3. Severe pruning of trees which have become overgrown. For the best street effect full-sized trees are in most cases too large. Heavy pruning may injure the vitality of a tree and shorten its life, but the advantage often justifies the process. The Sycamores on Eleventh Street, now six to twelve inches in diameter, were three years ago cut back to bare poles and mere stubs of branches. Now they are as perfectly formed and thrifty trees as can be found in the city. This season the Honey Locusts have been treated in the same manner, though less severely. This tree is too spreading in habit for the best effect as a street tree.

4. Prompt removal of trees which have proved unsuitable, or which have become unhealthy or hopelessly overgrown. This is a point often neglected on grounds under private management. Sentiment frequently resists with the utmost persistence changes which the best judgment requires.

5. Surrounding the bodies of trees on the leading streets with galvanized wire netting, a precaution rendered doubly necessary by the fact that hitching rings and posts are almost unknown, and that it is the custom here more than in ordinary commercial cities to restrain horses by a weight or leave them unhitched altogether.

If I were to note any omissions they would be, the failure to utilize to a sufficient extent the leading native trees of the

district, especially the Oaks, which occur in great abundance and variety; also to provide in the parks as well as on the streets for the landscape effect produced by massing trees of a single species under conditions permitting their full development. A grove of Oaks, Chestnuts, or almost any other kind of tree, in a commanding position, with an abundance of room, is a feature the production of which occasionally is worth the sacrifice of considerable temporary or local effect. Perhaps more of this will be sought in Washington in planning the new parks recently provided for on Rock Creek.

Washington, D. C.

A. A. Crozier.

Periodical Literature.

THE October number of the *Kew Bulletin of Useful Information* contains an article on cocoanut butter, a valuable edible fat prepared from the kernel of the cocoanut and recently introduced into commerce. It is a white, inodorless, almost tasteless fat, which solidifies at about sixty-five degrees Fahr., becoming above that temperature a pure white oil. Mr. Morris, the editor, says that "if cocoanut butter can be prepared, as is suggested, from the ordinary 'copra' or dried kernel of the cocoanut as shipped from tropical countries, there would be an almost unlimited supply of the raw material available from various parts of the world." According to Dr. Zerner, of the Royal Imperial and General Hospital in Vienna,

"The cocoanut butter, which, on account of its low melting point, is exported in tins, furnishes a pure white transparent mass of the consistence of lard without granular texture, which at a temperature of seventy-nine degrees Fahr. melts to a clear fluid and solidifies again at sixty-seven degrees Fahr. It has a slight agreeable smell, melts on the tongue, leaving a mild, but in no respect acrid taste behind it. In ether it dissolves completely. If the ether is evaporated over water and distilled water is added to the residue, the solution gives a neutral reaction. I have often repeated this test with cocoanut butter which had remained open for days (fourteen days), also with pharmaceutical preparations eight to fourteen days old, in the preparation of which cocoanut butter had been used. The cocoanut butter is therefore free from fatty acids, and even if left open for the space of eight to fourteen days does not turn rancid, with the exception of the top layer, which comes in contact with the air.

"With regard to its chemical composition, cocoanut butter differs from most other fats, and particularly butter, lard and margarin. In its fatty constituents and the amount of volatile fatty acids, it stands next to butter among solid fats.

"Cocoanut butter differs from all other vegetable and animal fats by its saponification degree (258.5 according to Rud. Benedikt in Vienna), and on account of this high saponification degree all adulteration is impossible.

"Artificial digestion tests seem to show that the cocoanut butter exercises no injurious influence whatever over digestion.

"The next point was to ascertain how the cocoanut butter stands with regard to micro-organisms. It is well known that in this respect milk butter is very far from perfect, as apart from the numerous germs, which, for the most part, are not pathogenic, that may be introduced during its preparation, and the microbes already present in the milk itself, this article of food affords an excellent nutrient fluid for a large number of micro-organisms.

"It follows that, although in any given case other ways and means of infection may be excluded, this may still take place through the agency of milk and butter. The possibility of a transfer to the human consumer of the Tubercle-bacillus, as well as of other micro-organisms, which have got into the milk from animals suffering from infectious diseases, is in the case of cocoanut butter, a vegetable fat, excluded from the first. Cocoanut butter has been proved by our investigations to be both free from germs and also to be a very bad nutrient medium for micro-organisms. Even when Agar-Agar or Ceylon Moss (*Gracilaria lichenoides*) was mixed with the cocoanut butter, and then allowed to remain open, the number of germs was found to be less than in Agar-Agar without the mixture of butter. One more experiment may be mentioned. If sterilized milk is added to cow butter and kept at a warm temperature the milk coagulates in twenty-four hours, proving the presence of bacteria in the butter. This coagulation does not take place if, instead of milk butter, cocoanut butter is added to the milk.

"From what has already been said the conclusion may safely be drawn that the cocoanut butter, from a chemical and bacteriological point of view, meets all the requirements of a food substance.

"Our further investigations were directed to ascertaining whether cocoanut butter was suitable to healthy and sick people alike. Through a period of four weeks we distributed food to 116 patients in the form of pastry, roast meats and farinaceous foods, in the preparation of which cocoanut butter was used in the place of fats.

"On account of this fat being almost free from water, one-quarter less may be taken, both in baking and cooking, than is generally used, if ordinary butter or lard is employed; and for the same reason it is necessary in making pastry to replace the twenty-five per cent. of water, which the cocoanut butter contains less than any other fat, by adding from seven to eight tablespoonfuls to about every pound of butter used.

"A little more salt must be added to the food, and the butter must always be heated before being used for cooking. Foods prepared in this way, as well as pastry, were always found to be eaten without any inconvenience whatever. The taste was undoubtedly pleasanter than in dishes prepared with animal fats. The statement of a colleague, Dr. H., is of particular importance in this respect. After recovering from disorder of the stomach he could not eat pastry without being afterward troubled with pyrosis and cardiac pain. He could eat pastry prepared with cocoanut butter almost without any inconvenience.

"The experiments with patients proved cocoanut butter to be an easily digested fat that causes no disorders in cases of impaired digestion. Of the 116 patients, amongst whom were individuals affected with every form of dyspepsia, not one complained of any discomfort or of any ill effect after the consumption of pastry prepared with cocoanut butter, though pastry, as a rule, is not an easily digested food on account of the fat. In three cases where the pastry was partaken of an hour after vomiting, there were no ill results noticeable; on the contrary, a fresh supply was desired by the patients.

"We arrive at the conclusion that a fat has been found in cocoanut butter which meets all hygienic requirements, and which is far superior to animal fat and butter, as well as to any of their other substitutes. Further, on account of its being easily digested, cocoanut butter is particularly well adapted for the use of patients suffering from impaired digestion."

Notes.

The largest Orange grove in the world will be planted this winter in the San Jacinto Valley, San Diego County, California. The largest grove at present is in Pomona and covers 400 acres. The new one will contain 700 acres of the best varieties.

Walpole used a pretty and epigrammatic expression in speaking of Kent, the "father of modern landscape-gardening." Dissatisfied with the formal style of gardening previously in vogue, "he leaped a fence," writes his biographer, "and saw that all nature was a garden."

Very many of the Horse-chestnut-trees which line the Prater and certain streets in the interior of Vienna bloomed profusely toward the end of last September. The phenomenon had often been noted there before on isolated trees, but is said never to have been so widespread as this year.

Freaks in fence-building are not uncommon in New England. Not many miles from New Bedford, for instance, is a solid fence with a curiously curved upper line and here and there a number painted upon it in white. On examination it proves to be built of the pew-doors from a dismantled church. And now we read in the *Times*, of Bath, Maine, an account of a man, attached to the life-saving station at Small Point, who has amassed enough of swords of the swordfish to build a picket fence forty feet in length.

The first Chrysanthemum exhibition held in Newport, Rhode Island, was open on the 11th, 12th and 13th of November. The attendance was poor, owing to unfavorable weather, but the display of flowers was satisfactory. The largest contributions came from the gardens of ex-Governor Wetmore and Mr. Louis Lorillard, but there were very creditable contributions also from Vice-President Morton, Mr. Fairman Rogers, Mrs. G. F. Jones, Mr. Cornelius Vanderbilt, Mr. D. B. Fearing and a number of others.

Among the highly successful Chrysanthemum exhibitions of the season was one held in Buffalo under the auspices of the florists' club of that city. Besides the plants and flowers exhibited by the city growers, Messrs. Pitcher & Manda, of New Jersey; Kimball, of Rochester; Dreer, of Philadelphia, and W. L. Scott, of Erie, Pennsylvania, contributed noteworthy

collections of Orchids and decorative plants. Some specimens of the Mrs. Alpheus Hardy were exceptionally robust and well grown, and a group of new Carnations of striking form and color were shown by Gustavus Schoenfeld, of Westfield, New York.

Mr. C. M. Weed, of the Ohio Experiment Station, in speaking of the Curculio which is destructive of Rhubarb, says that during the present year its life history has been traced, and it now appears that the insect hibernates as an adult, and in spring deposits its eggs in certain common species of Dock, especially Curly Dock—*Rumex crispus*. From the discovery of the breeding habits of this Curculio it seems evident that the best way to prevent its ravages is to destroy the Dock-plants on which it develops. If these are pulled up, roots and all, say late in June, before they have gone to seed, and burned, a great many of the insects will be destroyed.

Hundreds of thousands of plants and flowers are now on exhibition in Madison Square Garden. The display is not only remarkable as the collection of a single firm, the Messrs. Pitcher & Manda, but it would be classed as an admirable exhibition anywhere. Chrysanthemums are, of course, a leading feature, and although the season is so well advanced many first-class blooms are seen. The bank of Cypripediums in the centre of the Garden could not be duplicated by any establishment in the world, and the exhibition is rich in other Orchids, specimen Palms and Ferns. The immense space is well filled, and the plants are tastefully and effectively arranged.

The tomb of the poet John Boyle O'Reilly is to be marked in Holyhood Cemetery, Brookline, Massachusetts, by a giant boulder about twelve feet in diameter, which lies just as the glacier left it on the crest of a picturesque little hill. It would be well if monuments of this sort were more often used in our rural burial-grounds instead of the costly, ugly and obtrusive specimens of the stonecutter's art which are too commonly employed. Even if such a stone cannot be found in an appropriate place, it can easily be removed and so arranged with vines that will quickly drape it, that it will present a natural appearance. Nothing is needed to fit it for a monument except that a small space should be smoothed like a tablet to bear the inscription, as will be done in the case of Mr. O'Reilly's tomb. Apart from their harmonious and modest, yet dignified, effect, no monument is so imperishable as one of these which Nature herself has made.

The great game park which Mr. Austin Corbin has established near Newport, New Hampshire, and which contains 22,000 acres chiefly of mountain land, is being rapidly stocked with animals. Already some 250 head of buffalo, elk, moose, black-tail deer, white-tail deer, red deer, caribou, antelope, and wild boars from the Black Forest of Germany are roaming at large in the park, while contracts for as many more animals have been made with trappers at the west. Some of the species have already begun to breed, and the scheme promises results as satisfactory to the lover of great game as to those who are interested in any enterprise which involves the preservation of large tracts of beautiful country in their natural condition. It is said that Mr. Corbin does not intend to allow his animals to be hunted, and it will be some time before he must decide what shall be done with them when they have multiplied in excess of the capacity of the park to support them.

In an address before the Pennsylvania Horticultural Society Mr. John Thorpe stated that many forms of Chrysanthemums were undoubtedly introduced from Europe to America before the beginning of the present century, and that he had traced back some varieties as far as 1811, and, indeed, he exhibited a variety which had been cultivated in one family for more than sixty years. There are many kinds to be seen in Virginia that have been known there for over fifty years. They are nearly all Pompons, though some are of the Chinese sorts, as old Lilac, Golden Yellow and the Changeable White. He added that he had lately seen in a volume of the *Gardeners' Monthly* for 1860 an account of an exhibition thirty years ago in Philadelphia in which Chrysanthemum-plants of perfect shape and fifteen feet in circumference were shown. Some of the Pompons, like Madame Lafarge, Sacramento, Rosette and Napoleon, had between two and three thousand flowers expanded at once upon them.

The inhabitants of New York State seem at last to be awake to the necessity of preserving their forests. Together with the promising outlook of the scheme for forming a great state

park in the Adirondacks, we have to chronicle the fact that a movement has been started at Kingston for the establishment of a similar park in the Catskills, and that the matter, it is hoped, will be brought before the incoming Legislature. The state already owns 30,000 acres in the Catskill region, and it is probable that this amount will be increased by the Comptroller's tax-sale which will take place in December. Many private parks have within recent years been established in these mountains, and despite the fact that they were formed to accommodate colonies of summer visitors, the preservation of the forests has been helped, not hindered, by them. The amount of forest which is cleared for the building of houses is very small in comparison to that which must be preserved to perpetuate the charm of neighborhood and outlook upon which the value of the dwellings depends. Their owners have chosen the various sites for their picturesque beauty, and understand that this beauty must be kept as intact as possible. Nevertheless, there is room and need, here as well as in the Adirondacks, for the establishment of a state reservation.

On the occasion of a ball recently given in the club-house at Tuxedo Park the decoration of the ball-room was entrusted to an expert, who, nevertheless, is not a florist—Miss Stearns, of the Associated Artists of 115 East Twenty-third Street. The result proved that something might be done in the way of floral decoration which would lack the conventionality that so often marks such arrangements without falling into the heterogeneousness of amateur attempts. The room is very large and circular in shape, with fourteen windows alternating with fourteen columns which sustain the cornice. On one side is a stage where the musicians were to sit. This was decorated in harmony with the pretty woodland scene which formed the background, high Palms flanking the sides, while a row of lower Palms, mingled with Chrysanthemums, bordered the stage, and trailing Ivy fell over the front. Chrysanthemums were also intermixed with the taller Palms, in three shades of pink, making a charming effect as the electric light shone up over them from the foot-lights. This scheme was continued around the room by banking the window-recesses with Hemlock boughs and great sprays of white Chrysanthemums, the dark green foliage being carried up into the coves of the domed ceiling. The columns were covered with autumn foliage, Oak-leaves of a dark reddish bronze color forming the base, and being shaded gradually up into terra-cotta tones and finally into the yellow of Maple foliage. On this background Chrysanthemums were arranged, likewise in graded colors, beginning below with dark red blossoms and shading up to the capitals, which were encircled by masses of golden Grandiflorums. To obviate, however, an undue contrast between these red and yellow pillars and the pink and green of the stage, the two columns adjoining these were differently treated, being wound with Hemlock foliage interspersed with white Chrysanthemums—the same scheme of color chosen for the window recesses. The total effect of the beautiful room thus adorned was at once dignified and festal, and—an essential consideration in such cases—it made an excellent background for the gay dresses which filled it.

Catalogues Received.

WILLIAM BULL, Chelsea, London, S. W., Eng.; Tuberous-rooted Plants and Bulbs.—JOHN LEWIS CHILDS, Floral Park, Queens County, N. Y.; New and Rare Flowers; Bulbs, Plants and Fruits.—A. M. C. JONGKINDT CONINCK, Dedemsvaart, Netherlands; Wholesale Trade-List of Coniferae, Rhododendrons, Roses, Fruit-trees, Hardy Perennials, etc.—ELLWANGER & BARRY, Rochester, N. Y.; Fruit and Ornamental Trees, Shrubs, Roses, etc.—THE EUREKA STEAM HEATING COMPANY, Rochester, N. Y.; The Plaxton Hot Water Heater.—J. ROSCOE FULLER & Co., Floral Park, N. Y.; Hardy Bulbs and Plants.—C. S. HARRISON, Franklin, Neb.; Descriptive Catalogue of Rocky Mountain Evergreens.—V. H. HALLOCK & SON, Queens, N. Y.; Autumn Bulbs and Plants.—C. S. HOOD & Co., Corning, N. Y.; Heaters.—HERENDEEN MANUFACTURING Co., Geneva, N. Y.; The Furman Vertical Water Tube, Steam and Hot Water Heaters.—J. T. LOVETT Co., Little Silver, N. J.; Wholesale Price List of Small Fruits and Fruit-trees.—T. V. MUNSON, Denison, Texas; Strawberries, Grape-vines, Fruit-trees, and Ornamental Trees and Shrubs.—NEW YORK CENTRAL IRON WORKS, Geneva, N. Y.; Steam Engines and Boilers.—OSGOOD & THOMPSON, Binghamton, N. Y.; Scales.—G. W. PRESSEY, Hammon-ton, N. J.; Incubators.—PIERCE, BUTLER & PIERCE MANUFACTURING Co., Geneva, N. Y.; Heaters.—PITCHER & MANDA, Short Hills, N. J.; Orchids.—REASONER BROTHERS, Manatee, Fla.; Tropical and Semi-Tropical Fruit Plants, Economical, Medicinal and Useful Plants, Aquatics, Palms, Orchids, etc.—SYRACUSE CHILLED PLOW Co., Syracuse, N. Y.; Plows.—P. & E. TRANSON BROTHERS, Orleans, France; Nursery Trade List.

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National Forest-Reservations.

ON the last day of the first session of the present Congress a bill was passed "to withhold from settlement, occupancy and sale, and to set apart as reserved forest-lands" the entire basin where the waters gather and through which they flow before they reach the Yosemite Valley. The boundaries designated in the bill include 1,500 square miles, and the Yosemite reservation is thus practically enlarged to thirty times its original extent. In the same bill two other reservations are set apart south of the Yosemite, which really add 150 square miles to the Tulare Park provided for in a bill passed earlier in the session. Besides these enactments, a bill to enlarge the Yellowstone Park passed the Senate, and comes before the House with no serious opposition beyond what is made by a corporation which seems to be lobbying for some exclusive privileges. There is little danger that Congress will rescue from desolation too large an area of mountain forests, and in a few years every one will wonder why our law-makers were so short-sighted as to permit the failure of Senator Edmunds' bill to establish a great reservation in northern Montana about the headwaters of the Flathead River and some of the tributaries of the Missouri, a region which contains some of the grandest scenery of the continent.

Of course, every year's delay makes such legislation more difficult, and as the unprotected forests are burned and the unprotected game is butchered much of the land now eligible will be hardly worth holding in reserve. The most thoughtful people of New Hampshire may well regret that the White Mountain forests were not held at their true value twenty-five years ago ; and it will cost the state of New York millions of dollars to save a remnant of the North Woods, although the entire wilderness might have been bought at a comparatively trifling expense when Horatio Seymour recommended such action. There is little hope that any considerable stretch of the primeval forests which still clothe many of the slopes and crests of the Appalachian Ranges from Virginia to the Big Smokies will be preserved to give our descendants an idea of their magnificent proportions and their unequalled variety.

In a few years, unless Congress continues the good work recently begun, the same lamentation must be taken up for the forests on the national domain which are so rapidly passing from under the control of the general Government.

If we assume that the recent action of Congress indicates a change of policy and that other "parks" and forests in our western mountains are to be reserved, some systematic scheme of administration will need to be devised. The attempts of governments, state and national, to protect what has been reserved have not proved up to this time conspicuously successful. When Congress refused to make any appropriation for the superintendence of the Yellowstone Park, this wonder-land was handed over to the control of an officer of the army with a troop of cavalry. Although this officer as acting superintendent could only exercise a limited and inadequate authority under the law, the presence of a disciplined force representing the power of the United States has proved the most efficient means of protection which has yet been tried. It is our belief that neither the national reservations nor the public forests will be safe until the United States army is actively engaged to protect them. It may well be that something in addition to the visible power of the Government in the presence of the army will be needed to secure the widest usefulness of these reservations. If so, it might be well to consider the advisability of some board of commissioners like the one proposed in Massachusetts to administer grants of forest-land, or of places of historic interest or natural beauty. There are men of leisure and cultivation in the country who would be glad to render such service gratuitously. Or the administration of all the reservations might be entrusted to some body of similar constitution to that of the Light-House Board, a body, for example, composed of army officers and men of recognized acquirements in forestry and such other subjects as would give weight to their counsel in the management of such a trust.

Attention is directed to these questions now, because the discussion of them cannot begin too soon. We are sure that the action of Congress in establishing these new reservations will be heartily commended throughout the country, and that further legislation in the same line would also be approved. It is to be hoped that the action of Congress in regard to the maintenance of these reservations, new and old, will be as wise as their recent legislation has been timely.

THE appointment of Mr. Frederick Law Olmsted as landscape-gardener to the committee having the Chicago "World's Fair" in charge, seems to promise that due regard will be paid to the disposition of the various buildings and their interdependence as parts of an organic whole. It was the masterly manner in which the buildings were grouped and surrounded by plantations which rendered the last Paris Exposition infinitely more impressive and interesting than any of its predecessors in any country. There, however, the fact that the site included broad slopes descending to the river on one side, and from the river on the other, and that on the upper slope the fine terraces of the Trocadero Palace already existed, facilitated the designers' work. At Chicago a perfectly level site must be dealt with, although, indeed, it has the advantage of a magnificent lake front and of wide park areas already planted. Considering the character of this site there is food for reflection in the following paragraph, which we quote from the *American Architect and Building News* : "We have always thought that the future Chicago buildings might, with a little judicious expenditure for concrete terraces and similar works, be made much more imposing than those of any previous exhibition. There is likely to be plenty of room at Chicago, as there was at Philadelphia, and this makes it all the more advisable, as an artistic matter, to connect the buildings by terraces, balustrades, colonnades or something of the kind, so as to avoid the impression suggested at Philadelphia, that the various structures had been prepared by the inhabitants of different planets and rained down at random on Fairmount Park."

City House-Gardening.

THE opportunities for gardening available to the average city-dweller are so circumscribed that he is apt to consider them hardly worth using. Garden space is usually limited to a few square feet between the house and the sidewalk, or to the back-yard, and to the windows and possibly the roof. Attempts at cultivation are confined as a rule to the handkerchief-like bit of ground in front, where the grass is sometimes kept in good condition by the residents of a whole block, who unite in engaging a man with a lawn-mower to maintain it for the season. If anything is done beyond this, efforts are usually confined to the planting of a few *Geraniums* or a solitary shrub, which may blossom for a few days in this or that part of the season and show little life or beauty the rest of the year.

A distinctive advance, however, has been made in some of our cities of late years. One evidence of this is the universal favor which the Japan Creeper (*Ampelopsis tricuspidata*) has found. Its use on the house-fronts is a great relief to our city streets, and in most of them is an improvement upon shade trees, which are out of place in a closely built urban thoroughfare that is not of exceptional width. In certain quarters of some cities good examples of house-front gardening have proven so infectious that even a suburban resident, accustomed to more ample spaces, finds delight in wandering through them and noting the diverse effects. These are often charming, and are carried through the season from early spring to late autumn. In a sunny exposure the coming of the spring will often be manifest far in advance of the season out in the country close by, and the grass of the little space will be gay with *Snowdrops*, *Crocuses*, *Hyacinths*, *Tulips* and *Narcissus*, in succession, while the scent of the sweet *Violet* pervades the air. Through the summer the doorsteps will be bordered with pots of *Hydrangeas* and a variety of other flowering plants, with perhaps *Bamboos* and other tropical plants in tubs. On the house-front a variety of surface is presented, perhaps, by the Japanese *Ampelopsis*, irregularly diversified with *Virginia Creeper* and *Wistaria*, and possibly inlaid with the dark glossiness of the English Ivy, which occasionally flourishes even in our more northerly cities. All this luxuriant greenery contrasts with the background of rich red brick, or of the always harmonious hues of stone, be they brown, buff or gray. Then possibly the windows may contain masses of bloom in boxes, and the doorway likewise be crested with a floral glory. In the autumn the gorgeousness of the creepers as their leaves turn vies with the country-side in splendor, and, as the tender growths on the doorsteps are retired, their places are taken by the *Chrysanthemum*, and the season expires in a prismatic array of color.

Even in a tenement street there may be encountered an occasional oasis of bright blossoms in some window—often a token that Germans or Italians inhabit the place. In Boston the action of the Massachusetts Horticultural Society has multiplied these sights to a remarkable degree by the encouragement it gives to children for window-gardening, and many eyes and hearts are thereby gladdened.

The opportunities offered by the back-yard are almost entirely neglected, and that locality is usually a sorry place in our cities. We should go to school to the Japanese to learn what is possible here. In that important and extremely interesting work, "Japanese Homes and Their Surroundings," Professor Edward S. Morse devotes a chapter to the garden. As an illustration of how the smallest areas of ground are utilized for gardens and garden effects, he recalls an experience in a cheap inn: "The immediate surroundings indicated poverty, the house itself being poorly furnished, the mats hard and uneven, and the attendants very cheaply dressed. In the room where our meal was served there was a circular window, through which could be seen a curious stone lantern and a Pine-tree, the branches of which stretched across the opening, while beyond a fine view of some high mountains was to be had. From where we sat on the mats there were all the evidences of a fine garden outside; and wondering how so poor a house could sustain so fine a garden, I went to the window to investigate. What was my surprise to find that the extent of ground from which the lantern and the Pine-tree sprung was just three feet in width! Then came a low board fence, and beyond this there stretched the rice-fields of a neighboring farmer. At home such a narrow strip of land would in all likelihood have been the receptacle for broken glass and tin cans, and a thoroughfare for erratic cats; here, however, everything was clean and neat—and this narrow plot of ground, good for no other purpose, had been utilized solely for the benefit of the room within."

Again he says: "The Japanese have brought their garden arts to such perfection that a plot of ground ten feet square is capable of being exquisitely beautified by their methods. . . . With cleanliness, simplicity, a few little evergreen shrubs, one or two little clusters of flowers, a rustic fence projecting from the side of the house, a quaintly shaped flower-pot or two, containing a few choice plants, the simplest form of garden is attained. So much do the Japanese admire gardens and garden effects that their smallest strips of ground are utilized for this purpose. In the crowded city, among the poorest houses, one often sees, in the corner of a little earth-area that comes between the sill and the raised floor, a miniature garden made in some shallow box, or even on the ground itself."

I lately noted a charming back-yard effect while passing a house that was undergoing reconstruction for business purposes. The front and rear of the first story had been removed, so that the large rectangular opening at the further end seemed like a framed picture in which were revealed gracefully disposed masses of vines and shrubs with some picturesque architecture for a background. But such glimpses are rare. The back-yard of any city house is capable of being made a delightful spot instead of the desolate space that it now almost universally is. Even the absence of full sunlight is no insurmountable obstacle, for *Ferns* and *Mosses* will grow luxuriantly in a place that is always shady, as well as many beautiful shrubs and plants, including the shadow-loving *Begonias* and *Fuchsias*, whose abundant masses of brilliant flowers, with their variety of coloring, show most luminously against the cool green semi-obscure of such a place.

Roof-gardens have a great attractiveness in a city, and we occasionally hear of some very delightful places of the kind. They have the advantage of light and air, and often of a beautiful view, with space for awnings, hammocks, easy chairs and other comforts that go far to reconcile the stay-at-home to his lot of life in town for the summer.

Were it not that so many families leave town so early in the season and do not return until summer has passed, we should see more attention paid to city-house gardening. But, as it is, there are thousands of even well-to-do families some of whose members stay in the city the greater part of the summer, and who would be well repaid for taking some trouble in this direction.

A Vase of *Chrysanthemums*.

THE recent exhibitions at Boston and Philadelphia proved by many good examples the decorative value of *Chrysanthemums* cut with long stems and loosely arranged in vases. The best varieties for this purpose are not those considered of the highest merit according to exhibition standards. The flowers should not be too large, and should excel in breadth rather than depth. They should have abundant foliage, so that no other contrast to the flower is needed than a good background. If only one variety is used the effect will generally be stronger than if different forms and colors are employed together. Perhaps, too, it is desirable to emphasize the special qualities of this favorite flower, which are a profusion of bloom and a mass of color, and in that case we should use as many flowers as possible, without giving the appearance anything like crowding.

Our illustration, page 587, shows a vase of the flowers of the *Chrysanthemum* Ada Spaulding. The flowers of this variety have great substance, and when well grown are very deep. A group of them on longer stems and standing rather more erect than those in the illustration would probably have a bolder and more characteristic effect. The *Ada Spaulding* has gained a high rank among the newer kinds of this type. The plants have a vigorous habit, the flowers are massive, well imbricated and usually colored in a pleasing way. The flowers here shown are from strong plants, as is evident from their healthy foliage, although they are not so finely imbricated as many exhibition specimens which we have seen. The illustration, however, is not meant to display the special qualities of this variety, but to indicate one of the best ways in which *Chrysanthemums* can be employed for in-door decoration. It is taken from a photograph of one of the vases which were exhibited at Boston by Galvin Brothers, and which were characterized in our report as one of the noteworthy features of the show. The flowers were grown by Mr. S. J. Colman.

The simple, uncombined landscape, if wrought out with due attention to the ideal beauty of the features it includes, will always be most powerful in its appeal to the heart.

Ruskin.

Notes on the Distribution of Some Kansas Trees.— I. The Red Cedar (*Juniperus Virginiana*).

A STUDY of the distribution of trees in Kansas furnishes many facts of interest to the student of forestry. On the east the dense forest growth of Arkansas and southern Missouri extends but a short distance into the state. Of about seventy species of trees with which Kansas is credited, the majority can be found in the eastern tier of counties. Along the line of the hundredth meridian the number of species is reduced to a dozen, of which not more than two or three will reach the Colorado line. This gradual thinning out, first of species and at length of entire genera, under the more trying conditions encountered as we move further west, will afford suggestions to one wishing to select the most hardy trees for the planting of timber-claims or shelter-belts in the prairie region.

A peculiar feature of timber growth in the western part of Kansas is that the trees on the main stream may entirely disappear, while upon many of its tributaries, back but a few miles, quite a heavy growth may be found where there is not water enough in the stream to float a canoe. The only explanation that I have seen offered for this was that the beaver had kept down the young trees on the larger stream, where there was a sufficient volume of water for them to work. Perhaps we should add to this the work of fires, floods and grinding ice, which could readily be carried over the low sandy banks of these streams. The nature of the soil may have been the most important factor of all, for the bottom lands along these treeless streams are very sandy, and the low banks slope so easily to the water that where the grass is dense enough the fire could sweep to the water's edge. Superficial observers of Kansas timber have often been misled by this lack of trees along the Saline, Smoky Hill and Arkansas Rivers, and supposed that they had passed west of the timber limit of the state.

The commonly planted Cottonwood, though one of the most westerly trees in distribution, is a moisture-loving tree and is seldom found growing naturally far from streams or springs. It is not surprising that of the many thousands of these trees planted on high prairie the majority die after a few years of encouraging growth. It is to trees which are found growing on more dry and elevated locations that we must look for the greatest success in maintaining forest-conditions on the uplands. The Hackberry (*Celtis occidentalis*), for example, is often found along western streams growing upon the face of some rocky bluff where only the most scanty supply of moisture can reach its roots. The farmers in these localities report it as being one of the most successful trees that they can use in dry situations.

The Red Cedar is found in Kansas in a much more western habitat than has usually been assigned to it, and often growing in such dry and sterile places that it would seem as if it could thrive anywhere if once its roots obtained a hold upon the soil. Throughout the carboniferous formation of the south-eastern part of the state this tree is frequently found, usually growing along rocky banks and rugged bluffs overlooking the streams, and by the very barrenness of the spot fully protected from the approach of fire. Here they give a picturesque touch to the landscape which is very pleasing, especially during the winter months. West of the lower Republican Valley they disappear, only to be found again in isolated stations much farther west. In the eastern part of Trego County the geological formation is a soft, chalky limestone; and on the south side of the Smoky Hill River this rises in considerable bluffs. In Ranges 22 and 23 west, or within about twelve miles of the 100th meridian, a group of these chalk hills is known as Cedar Bluff, and at one time their abrupt northern slopes were covered with a fine growth of Red Cedar over an extent of several hundred acres. A small tributary from the south, entering the river at this point, is locally known as Page Creek. Near its head is another chalk bluff, which was once equally well timbered. With the settlement of the prairies these trees were cut and hauled away to furnish ridge-logs and rafters for the sod-houses, while every branch, and even the stumps and roots in many cases, were used as kindlings for the cow-chip fires. The Page Creek Cedars were almost exterminated in this way, and all the more valuable growth on Cedar Bluffs was taken; but here young trees are coming in to some extent, and in time, if protected, the growth may be restored.

Scattering groups of Cedars are remembered by the old settlers along the upper Solomon River growing in this same chalky formation. Somewhere on the upper Republican River, in early times, a large raft of these trees was cut and

floated down the stream to the lower part of Clay County, where it came to grief on a sand-bar, and was distributed among the settlers. The presence of these isolated groves of Cedar so far west would seem to indicate that the climate is not so arid that they could not be grown artificially on a much more extensive scale. These trees were all in such situations as to be secure from fires and from the rush of thousands of sharp hoofs when this country was the pasture land of the buffalo.

On account of the expense of procuring young trees and the difficulty in making them live through the summer drought following their planting, but few Cedars have been set out, except for ornament or as an occasional shelter belt. So far as they have been tried near their native stations they have been found very successful when once established. Accurate measurements of growth for any of the more western specimens are not in my possession, but trees can be found around Manhattan twenty years old which are eight to twelve inches in diameter at the ground and twenty to twenty-five feet high. Up to about fifteen or twenty years old, if not too crowded, they retain their limbs to the ground, and form a beautiful spire-like top. Beyond this age the lower branches die and the top becomes more round or irregular. An old specimen with grotesquely distorted trunk and gnarled and twisted branches is occasionally found growing from a cleft of a rocky ledge, where it is very picturesque.

It is to be hoped that the experiment may soon be tried of planting considerable tracts of these trees on high prairie and rocky land. As it is too expensive an enterprise for the average homesteader to undertake, state or government aid should be given in the matter. Those railroad companies that have to meet the heavy expense of keeping up miles of snow-fence along their lines would do well to try the Red Cedar on a small scale, and might find that a living wall of evergreens would be a more effective snow trap than a board fence, and maintained at a fraction of the cost. The comparative beauty of the two as seen from the train need not be dwelt upon.

The valuable suggestion contained in a recent editorial of GARDEN AND FOREST on the Improvement of Trees would doubtless apply well in this state, and seedlings grown from these native acclimated Cedars of the far west might be expected to endure the drying summer winds of the prairies better than stock derived from eastern forests.

Kansas Agricultural College.

S. C. Mason.

The Cranberry Scald.

THE last crop report of the Secretary of the American Cranberry Association states that the present harvest is the smallest in New Jersey since 1884, and the Cranberry crop is twenty-two per cent. less than that of last year. The primary cause of this falling off in the yield is the trouble so well known as the "scald." I have made some study of this serious disease during the past two years, and hope that some light can be thrown upon this subject which may lead to improved bog management and at least to a partial mitigation of the trouble.

The disease makes its appearance in the fruit when it is about half grown, and may be detected as soft spots, quite small at first, but usually extending throughout the berry, when it takes on the appearance of one that has been partly cooked, although the skin remains unbroken. The skin being tough, the berry hangs as a collapsed cornelian bag for several weeks, when it finally falls to the ground. It is, however, not uncommon to find many scalded berries upon the vines in early spring. Frequently the berry remains half rotten, with a distinct line between the healthy and decayed portion, as shown in Fig. 75. After a time dark patches form beneath the skin, and pimples make their appearance upon the surface of the decayed part, as indicated in the engraving.



Fig. 75.—A Berry Partly Scalded.

When a diseased berry is studied with a compound microscope, the soft tissue is found to contain a great abundance of threads, which are no part of the substance of the healthy berry. The pustules upon the skin are made up of aggregations of these threads, in which a cavity forms as a small pit or cup. A section of one of these pits is shown very highly magnified in Fig. 76, and the internal structure is made plain. It consists of a multitude of fine threads, forming the wall of the cavity, with the inner surface lined with small projecting threads that bear minute spores upon their tips, and falling away escape through a slit or opening in the pustule.

All of this filamentous portion above described is a Fungus that is parasitic upon the cranberry, and feeding upon its

tissue induces decay, and finally produces a worthless, rotten berry.

An examination of other portions of plants bearing scalded berries showed that the same Fungus penetrates all parts of



Fig. 76.—Section of a Pustule.

the plant. Such infested plants have a half dead appearance, the leaves turn brown prematurely and readily drop from the vines. A leaf half affected with the Scald Fungus is shown in Fig. 77. The upper portion had turned brown, and upon its surface are many pimples similar to those already noticed upon the leaves. These pustules appear under the microscope to be practically the same as those on the berry.



Fig. 77.—A Leaf Half Scalded.

A study of the stem revealed the presence of the threads of the Fungus, and they were traced down to the root and into the soil. It is thus seen that the whole vine is infested and the infection is not confined to the berries. Deeply seated as the trouble is found to be, it is evident that any application of a fungicide to the berries could scarcely prove effective. Here is a case when the bog itself appears to be infested, and this is difficult to reach with remedies.

It is a fact obtained by an extended correspondence with Massachusetts cranberry-growers that the scald is with them only little known and not particularly damaging. The method of making the bog is quite different on Cape Cod from that in New Jersey. There sanding is considered a requisite, and the bogs are kept clean of weeds; but in New Jersey sanding is not practiced, and grass and weeds are not uncommon.

The great difference noted may have much to do with the prevalence of the scald in the last named state. While there are differences of temperature, rain-fall, etc., they are not great enough to warrant the assigning of meteorological conditions as those which control the scald.

It seems safe to assert that the soil conditions have the most to do with the development of the trouble, and in so far as these are subject to modification the scald is a subject for future control, but to what extent remains to be determined. It is suggested that if possible the soil conditions prevailing in Massachusetts be made those for New Jersey. Upon some scalded bogs it may be impracticable to do anything; sanding may be out of the question, and there may be a poor water supply, or it is not under control. There should be a healthy bog soil, not constantly water soaked and "sour."

The experiments during the present year with various chemicals applied to the vines and to the soil have not produced the desired results. It is predicted that the best results will come from experiments along the line of bog sanitation—that is, better water control and the provision for healthier conditions for the roots of the plants. Decaying vegetation and stagnant water are two of the probable conditions for the development of the scald.

Rutgers College.

Byron D. Halsted.

New or Little Known Plants.

New Orchids.

SOBRALIA LOWII, Rolfe, is a dwarf and pretty little species, introduced from New Granada by Messrs. Hugh Low & Co., of Clapton. It grows from about twelve to eighteen inches high, and the flowers, which are freely produced, are of a uniform bright purple shade. It is allied to *S. sessilis* and *S. decora*.—*Gardeners' Chronicle*, October 4th, p. 378.

SOBRALIA WILSONIANA, Rolfe, is a fine species, introduced from Central America, with *S. leucoantha*, by Messrs. F. Sander & Co., of St. Albans. It flowered in the collection of A. Wilson, Esq., of Westbrook, Sheffield. It is apparently allied to *S. Warszewiczii*, and has the habit and stature of *S. leucoantha*. The sepals and petals are four and a quarter inches long, white, suffused with pale rose, while the lip is

rosy pink in front, paler behind, and with the disc and throat bright yellow.—*Gardeners' Chronicle*, October 4th, p. 378.

MASDEVALLIA × *MEASURESIANA*, Rolfe, is a very pretty little hybrid, raised by Messrs. F. Sander & Co., of St. Albans, from *M. tovarensis*, fertilized with the pollen of *M. amabilis*. It resembles the pollen parent in habit and in the terete peduncles, but in the shape and color of the flower it approaches nearer the characters of the seed-bearer. The perianth is white, with lilac nerves and margin, and darker tails.—*Gardeners' Chronicle*, October 4th, p. 379.

CYPRIPEDIUM × *H. BALLANTINE* is a neat and pretty hybrid raised in the establishment of Messrs. James Veitch & Sons by Mr. Seden from *C. purpuratum* fertilized with the pollen of *C. Fairieanum*. It is quite intermediate in character, rather inclining to *C. purpuratum* in shape, with the transverse reticulations of *C. Fairieanum* in addition.—*Gardeners' Chronicle*, October 11th, p. 408.

CATTLEYA AUREA IMSCHOFTIANA is a charming variety with pure white sepals and petals, and flowers somewhat smaller than usual. It was exhibited by Baron Schröder at a meeting of the Royal Horticultural Society on October 14th, when it was awarded a first-class certificate.—*Gardeners' Chronicle*, October 18th, p. 447.

CATTLEYA AUREA LINDENI is a beautiful variety with deep yellow sepals and petals and deep brown lip. It was exhibited by Messrs. Linden, L'Horticulture Internationale, Brussels, at a meeting of the Royal Horticultural Society on October 14th.—*Gardeners' Chronicle*, October 18th, p. 447.

CATTLEYA WAROCQUEANA FLAMMEA is a beautiful variety with rosy carmine flowers tinged with lilac, and the front lobe of the lip with a central crimson blotch. It was exhibited by Messrs. Linden at a meeting of the Royal Horticultural Society on October 14th, when it was awarded a first-class certificate.—*Gardeners' Chronicle*, October 18th, p. 447.

CATTLEYA WAROCQUEANA AMETHYSTINA is another very richly colored variety; the flowers of a deep rosy lilac, and the lip of a deeper shade, with narrow, paler margin. It was exhibited by Messrs. Linden with the preceding, and, like it, was awarded a first-class certificate.—*Gardeners' Chronicle*, October 18th, p. 447.

CATTLEYA DU BUYSSONIANA is a very pretty form of *C. granulosa*, with pale yellow sepals and petals, and the lip with crimson rose median lobe and paler side lobes. It was exhibited by Messrs. Linden with the preceding, when it received an award of merit.—*Gardeners' Chronicle*, October 18th, p. 447.

CATASETUM BUNGEROTHII, VAR. *RANDII*, is a beautiful yellow variety, which was exhibited by Messrs. Linden at a meeting of the Royal Horticultural Society on October 14th, and to which an award of merit was given.—*Gardeners' Chronicle*, October 18th, p. 447.

Kew.

R. A. Rolfe.

Plant Notes.

Some Recent Portraits.

Aristolochia longicaudata is well figured in the *Gardeners' Chronicle* of November 1st from a specimen brought to England from Demerara by Mr. Todd and cultivated by him. The flowers are cream colored, with purple, vein-like markings, the funnel-shaped throat at the top of the distended portion of the tube being velvety purple, covered with coarse white hairs with swollen bases, the points directed downward toward the bottom of the flower, where is placed the column of the stamens united with the styles. *Aristolochia longicaudata* belongs to the section of the genus in which the flowers are characterized by the solitary lip, which, in this case, is prolonged into a very long margined tail.

The colored plate in *The Garden* of London of the same date is devoted to an exquisite representation of *Benthamia fragifera*, the Indian representative of the Flowering Dogwoods of North America, the genus *Benthamia* being now joined by some authors to *Cornus*. We read that

"Where it will survive the winter without injury, and occupies an isolated position so as to allow of its full development, this native of Nepaul forms quite a tree, but with the character of a large shrub, the branches being numerous and wide-spreading, while they are plentifully clothed with oblong-shaped leaves of a rather distinct lighuish green tint. In some winters the foliage is almost evergreen, while in the case of an unusually severe one the greater part of it quickly drops. The flowers, which, in an established specimen, are usually borne in great profusion, are, as a rule, at their best during July and August. The reddish tinge which suffuses the major portion of the inflorescence is not nearly so pronounced when the

flowers are first expanded as it is after they have been open a few days. The blossoms, however, are but one part of its beauty, as the fruits of the *Benthamia* are wonderfully showy when ripe. They grow as large as a good sized strawberry, which they greatly resemble. When ripe, these berries are of a reddish hue, and though they usually ripen about October, they frequently remain on the trees throughout the winter."

In Cornwall and in the south of Ireland this plant seems to be at home, growing to a large size and flowering abundantly every year. It is little seen in less favored regions of Europe, and very probably has never been tried in America, although it would probably succeed in our southern states. There is a second species, *Benthamia Japonica* (*Cornus Kousa*), a smaller plant, with less showy flowers and fruit. This was introduced into American gardens many years ago, and has produced flowers at the Parsons' nursery in Flushing. As a purely ornamental plant, however, it has little to recommend it except its rarity over our common Flowering Dogwood of the east, *Cornus florida*.

Ipomœa ternata is represented at Kew by three most distinct varieties—namely, that known in gardens as *I. Horsfallia*, a second sometimes called *I. Briggsii* or Lady Briggs, and the third the type which was introduced a few years ago as *I. Thompsoniana*. The first of this trio is well known as one of the best of stove flowering climbers. Taken altogether, however, I think *I. Briggsii* is a more useful plant, on account of its freer, more elegant habit, and the profusion of its rosy crimson flowers in November. It is easily propagated from cuttings, and it will grow well with ordinary treatment. In the Palm House and also in the Victoria House at Kew it covers a large space against the roof, and its numerous shoots, which hang down several yards, are wreathed with flowers. The third variety is pure white, and, although larger than the other two, it is much less effective.

Lapeyrousia grandiflora is a hardy, autumn-flowering bulbous plant of considerable promise. In habit and foliage it resembles *Crocus*, grows about a foot in height and produces racemose scapes of flowers which are each fully two inches across. The segments are three-eighths of an inch wide and colored bright crimson, the three lower ones having a deep maroon blotch at the base. The behavior of the bulbs is the same as in *Crocus*, so that in time the plants should become common. *L. grandiflora* was introduced by means of seeds sent from Delagoa Bay to Kew in 1883. A figure of it (a poor one) was published in the *Botanical Magazine*, t. 6924. Last year a few of the bulbs were planted in a bed on one of the lawns at Kew and left out all winter. They have multiplied tenfold and flowered freely this autumn.

Kew.

W.

Foreign Correspondence.

London Letter.

CHRYSANTHEMUMS.—The exhibition held by the National Chrysanthemum Society has been as great a success as circumstances would permit. The collections of plants and cut blooms, the conferences and the crowds which were attracted by them were successes. The chief drawback was the utter unfitness of the Aquarium as an exhibition hall for plants and flowers, and the consequent absence of anything like an effective display. In a proper hall the vast collections of flowers, many of them magnificent examples of culture, and the large groups of well flowered plants, would have presented a floral picture such as has probably never been seen before. The excitement of competition centred in the Centenary Class for cut blooms, twenty-four Japanese and twenty-four incurved varieties, the prizes, of which there were five, being from £25 to £5. First honors were awarded to a magnificent collection of blooms shown by Messrs. Drover, of Farnham. Old Chrysanthemum fanciers declared this to be the most superb collection of flowers ever seen. Almost every flower was a picture in finish, color and size. I give the names of the sorts included in this collection. Incurved: Lord Alcester, Queen of England, Golden Empress, Beauty, Prince Alfred, Princess of Teck, Mrs. Heale, C. Gibson, Mrs. Coleman, Alfred Salter, Lady Hardinge, Mrs. N. Davis, Emily Dale, Princess of Wales, Alfred Lynne, John Doughty, Violet Tomlin, Lady Dorothy, Empress of India, Empress Eugénie, Mrs. W. Shipman, Nil Desperandum, Jeanne d'Arc, Miss M. A. Haggas. Japanese: Madame Bacco, Ralph Brocklebank, Avalanche, E. Molyneux, Comte de Germigny, Stanstead White, Etoile de Lyon, Sunflower, Mrs. C. H. Clarke, Pelican, Baronne de Prailly, Mrs. C.

H. Wheeler, Mrs. A. Hardy, M. Bernard, Criterion, Jeanne Délaux, Boule d'Or, Mrs. F. Jameson, E. A. Carrière, Lady T. Lawrence, Sarah Owen, Meg Merriles, Condor and Gloriosum.

Almost every one of the sorts here named occurred frequently in other stands and collections. The first-rate kinds, which were well shown, in addition to the above, were—Japanese: Mrs. H. Cannell, Val d'Andorre, Maiden's Blush, Fair Maid of Guernsey and Album Fimbriatum. Incurved: Lord Wolseley, Mr. Brunless, Mrs. Heale, Hero of Stoke Newington and Barbara.

Tastes differ in regard to the beauty of different Chrysanthemums; my own taste places Edwin Molyneux first among the Japanese, and the old Queen of England first among the incurved.

Of other classes there were excellent examples shown, the reflexed being represented by King of Crimson, Cullingfordii, Cloth of Gold and Pink Christine amongst others. The Japanese Anemones included fine examples of Mademoiselle Cabrol, Madame Blanche, Sabine, Dame Nelson and Fabian de Mediana. Pompons were not abundantly shown, but such kinds as President, Rubrum, Perfection and Elise Dordan were good. There are evidences of a growing preference for size in the flowers of this section, which if not checked will result in their being improved out of all character. Their small, compact, button-like flowers are their peculiar attraction.

Plants were exceptionally good for the south of England, Mr. G. Stevens, of Putney, winning first honors for six specimens which would have done credit to a show in Liverpool or Manchester. Trained Standards were also splendidly shown. Untrained plants were, however, very weak, and it is evident that this style does not as yet meet with much favor amongst first-rate growers. While this exhibition revealed general progress in cultivation and considerable growth in the interest shown by the general public in Chrysanthemums, it did not give us anything startling in the way of new kinds or new methods of cultivation.

The following new plants obtained certificates at the last meeting of the Royal Horticultural Society:

CHRYSANTHEMUM ARTHUR WOOD (Japanese); large, rich chestnut brown, tipped with gold. (Cannell.)

CYPRIPEDIUM ANTIGONE × (*C. niveum* and *C. Lawrencianum*), a beautiful addition to hybrid Orchids. The flower is large, rose colored, with a few streaks and dots of a darker color. (Messrs. Veitch.)

C. DORIS × (*C. venustum* and *C. Stonei*).—Large flowered, but unattractive in color, being a mixture of green and dull brown. (Norman Cookson.)

C. EYERMANNIANUM × (*C. barbatum* and *C. Spicerianum*), combines the characters of the two parents, but is not an improvement upon either. (Sander & Co.)

C. CLEOLA × (*C. reticulatum* and *C. Schlimi*).—A promising plant, distinct and pretty in the colors of its flowers; the dorsal sepal is pale yellow, the petals cream colored and the lip white tinted with rose. (Messrs. Veitch.)

ODONTOGLOSSUM DUVIVIERIANUM.—A yellow tinted variety of *O. cordatum*. (M. Linden.)

VACCINIUM CORYMBOSUM, shown as *V. Pennsylvanicum*. The color of the leaves in autumn is a rich orange-red. In England this shrub is scarcely known, although at Kew and apparently in Mr. Waterer's nursery at Knap Hill it is exceedingly ornamental in November.

QUERCUS TINCTORIA, also shown by Mr. Waterer as the Knap Hill Scarlet Oak. Until the leaves fell the trees of this and of many other Oaks at Kew were exceptionally rich in color this autumn. Both the *Vaccinium* and this Oak were certificated on account of their ornamental foliage.

PRIMULA IMPERIALIS.—The true plant of this name is now in cultivation at Kew, where it has been raised from seeds imported from Java, on the highest mountain of which island this gigantic species was met with by Wallace, and described in his delightful book, "The Malay Archipelago." This *Primula* has leaves eighteen inches long and nearly six inches wide, while its erect flower-spike attains a height of five feet, the flowers being in whorls as in *P. Japonica*. About eight years ago an allied plant, or possibly a geographical form of this Javanese giant, was introduced from the Himalayas and flowered at Kew. A figure of it was published in the *Botanical Magazine* under the name of *P. prolifera*, the name *P. imperialis* being there quoted as a synonym. There is, however, a marked difference between the form and texture of the foliage of the Javanese and Himalayan plants, as well as that of dimensions, so that, for horticultural convenience at any rate, we may retain the name *Imperialis* for the Javanese plant. Next year, when probably the plants at Kew will produce flowers, we shall be in a better position to speak of their value in

gardens. The Himalayan plant finds little favor owing to the smallness of the flowers and their dull yellow color.

CHINESE PRIMULAS were the subject of a lecture by Mr. Arthur Sutton at a recent meeting of the Royal Horticultural Society. The well known firm of seed merchants, of which Mr. A. Sutton is a member, has for many years possessed a very superior "strain" of Primulas, obtained, I believe, mainly by themselves through crossing and selection. *P. Sinensis* was introduced into England from Chinese gardens about seventy years ago. As then introduced it was much superior to the wild type, having been improved by Chinese cultivators, with whom it had long been a favorite garden plant. The type we have been made acquainted with only recently through the collectors, the Abbé Delavay and Dr. Henry, whose specimens, collected in central and northern China, are now in the Kew Herbarium. The difference between the type as represented by these specimens and the best of the "strain" in cultivation in England is almost as great as the difference between the wild Chrysanthemum of China and its progeny as represented in gardens to-day. What is considered by Dr. Masters to be a very near approach to the wild Chinese Primula is now in cultivation in a garden in the Isle of Wight, where it was raised from seeds collected in China. I saw these plants in flower a few weeks ago; the flowers were small and pale lilac in color. The leaves, however, were much more interesting than the flowers, as when rubbed they emitted a strong agreeable odor. Messrs. Sutton have secured plants of this scented leaved variety. We may, therefore, look forward to possessing a strain of Chinese Primulas with fragrant leaves and large flowers.

Hitherto no one has succeeded in crossing *P. Sinensis* with any other species, or, rather, to be accurate, no one has flowered such a cross. I have seen seedlings which were undoubtedly hybrids between *P. Sinensis* and a Himalayan species, and which go to prove that such a cross is possible. Chinese plants are attracting more than ordinary attention in England at the present time, the result of Dr. Henry's and others' revelations of the floral riches of China which had not hitherto been dreamt of. At Kew there are seedlings of some of Dr. Henry's discoveries, and amongst them are plants of considerable promise.

LILIUM HENRYI.—I have only lately mentioned this new Lily as having flowered at Kew, but I refer to it again for the purpose of placing upon record a few facts recently communicated to me by Dr. Henry. It grows, he says, at higher elevations than *L. longiflorum*, and is therefore at least as hardy as that species. In Mr. Baker's description of *L. Henryi*, made from dried specimens, the umbel is said to contain eight flowers. Dr. Henry, however, says that thirty or more flowers are not uncommon on one stem. He also says that the stem attains a height of six or seven feet and that the bulbs are twice as large as a man's fist. From these particulars it is evident that in *L. Henryi* we have a plant of more than ordinary interest horticulturally. So far the bulbs at Kew have grown satisfactorily in an open border. They were very small and weak when received from China, so that the three-flowered stems produced by several this year may be taken as indicating a promising character for floriferousness.

Kew.

W. Watson.

Cultural Department.

Fern Notes.

MANY very pretty and useful Ferns are found among the Aspleniums or Spleenworts, and most of them being of moderate growth are well adapted for small collections. This is a very extensive genus, and seems to have representatives in almost all parts of the globe. Of the exotic species, and among the smaller growers, *A. alatum* deserves prominence, its pinnate fronds being about a foot in length and light green in color, and as the plant gains strength the fronds are frequently proliferous near the apex. When properly grown *A. alatum* is a very attractive Fern, but as slugs seem to have a decided liking for the young fronds of this species, some watchfulness must be exercised in order to secure perfect foliage.

A fit companion plant for this Spleenwort is *A. cicutarium*, a charming species from tropical America, which produces graceful, feathery-looking, light green fronds from a foot to fifteen inches in length. The pinnæ of this species are more or less deflexed, which gives the fronds the appearance of being wrong side up. *A. cicutarium* grows best in a rather warm house, and should at all times be well shaded. The soil best adapted for both these varieties is a rough, open mixture of

peat and sand, with some broken charcoal or sandstone mixed through it.

A. formosum is also an interesting species, and does not seem to be very common, though in cultivation for a number of years. Its fronds are dark green in color, with shining black stipes, and are pinnate, the pinnæ being deeply cut or serrated. The fronds of this species are said to attain a length of eighteen inches at times, but are more often seen from eight to twelve inches long. *A. formosum* should be treated the same as the preceding in regard to soil, shading, etc., and, being a rather delicate rooted species, should be carefully watered.

A. Belangerii is a robust growing species from Java, and produces gracefully arched bipinnate fronds of deep green color. The fronds of this species are also proliferous, and it is easily propagated by this means, as well as by spores. *A. Belangerii* is one of the best of the genus, and will stand much hardship without great injury, small plants being very useful for jardinières or window ferneries.

Another fine, strong-growing species is *A. Fabianum*, also known as *A. fœniculaceum*, the fronds of which are finely divided and reach a length of two to three feet. The mature fronds of this species are dark green in color, and are frequently weighted down by the mass of young plants produced thereon. This Fern will succeed under very ordinary treatment, the chief conditions of which should be a light, well-drained soil and an abundance of water.

A useful member of this genus for rockery or basket work is *A. longissimum*, a species that grows somewhat like a Nephrolepis, though with darker and coarser fronds. The fronds are pinnate, from one to three feet long, and proliferous at the apex. *A. longissimum* is a plant of strong constitution and free growth, and the fronds will be found admirable for many purposes when cut, for when mature they last a long time in water.

A. Serra is a somewhat uncommon sort introduced from Brazil, and produces from a creeping rhizome its bold looking dark green foliage, which attains from one to two feet in height, and is pinnate in form, the pinnæ being large and glossy. *A. Serra* also prefers a warm house, and under favorable conditions is a rapid grower, and makes an effective specimen for exhibition purposes.

Another good sort and of medium growth is *A. viviparum*, which bears some resemblance to *A. Belangerii*, though smaller. Its fronds are from six inches to a foot in length, dark green, and usually nearly covered with young plants; this species being notably prolific in this way. *A. viviparum* is easy to manage, and may be grown in a temperature of fifty-five degrees in good condition. This species is also valuable for small ferneries for table decoration; but it should always be borne in mind that Ferns for the latter purpose should be grown as cool as possible and with good ventilation, so that the fronds may be hard enough to stand a dry atmosphere.

Holmesburg, Pa.

W. H. Taplin.

The Belladonna Lily.

THIS is a bulbous plant and the sole remaining species of the once extensive genus of *Amaryl-lidaceæ*, the botanists having placed the other members under separate genera. The stout bulb supports numerous strap-shaped leaves, which appear in spring and early summer, and after completing their growth die down, to be succeeded, during August, September and October, by the flowers. These are of the spreading funnel-form characteristic of the order, and borne in many-flowered umbels on scapes from twelve to thirty inches high. There is considerable variation in the color of the flowers, which ranges from almost pure white to deep rose. In most forms the flowers are agreeably odorous, but there is a distinct variety, *A. Belladonna blanda*, the light rose colored flowers of which lack fragrance. The species was introduced from the Cape of Good Hope in 1712. There is some conflict of opinion, or perhaps mistake, among the authorities regarding the natural abode of this plant. Loudon and Nicholson place it in the West Indies, Johnson and Moore name the Cape. The latter says of this matter: "The *A. Belladonna* has been said to be employed for poisoning in the West Indies, but this statement appears to be a mistake, and probably refers to some other plant of the same order, the *Belladonna* being a Cape plant."

The Belladonna Lily is not difficult to manage, and may be successfully cultivated in two ways. In one of these a cold frame of southern aspect is chosen, with a soil deep, rich and sandy. The bulbs are planted from six to nine inches deep,



Chrysanthemum, Ada Spaulding—See page 582.

according to size, and sufficiently close for the flowers to form a compact mass when fully developed. They are more imposing in this way and the plants can more readily receive attention. The object of the cold frame is (1) to keep the plants dry after the maturity of foliaceous growth, a state which is found most favorable to the free production of flowers; and (2) to keep the bulbs dry and beyond the influence of frost during winter and spring. The early part of the latter season is the most dangerous period, for if the bulbs are not thoroughly covered with protecting material they are killed, or burst in growth, which is injured by frost so that the plants are of no use that season. All covering should be removed when danger of frost is past, and on the first indication of growth a vigorous development should be encouraged, for unless the plants make sound, healthy growth, and plenty of it, they will not flower well. A free supply of water and liquid manure during the growing period will secure luxuriant foliage.

A few plants in pots are handy in many places, and this is perhaps the most reliable and convenient method of growing them. They are easily cared for after the brief growing season; and set among Ferns, foliage and other flowering plants, to hide the bare pots and naked scapes, the appearance of the flowers in arrangements of low tone is extremely beautiful, while their soft shades have a magical effect among warmer tints. It is this power to bring out new beauties in other subjects, while improving its own, that has won for the plant the popularity it enjoys. The bulbs do not always flower simultaneously, and, therefore, in pot culture it is most satisfactory to plant the bulbs singly. This course has the further advantage of affording greater facility in moving the plants about, and the pots, being smaller than would be required for several bulbs, are more readily obscured when it is desirable to keep them out of sight. Pots seven inches in diameter are large enough for average bulbs. It is a strong point to have the drainage perfect, for although the plants like abundance of water at a certain stage, they are injured by anything approaching saturation. A rich sandy soil is requisite, and this is obtained in a mixture of loam, thoroughly decomposed manure and sand in equal parts. It is best to pot the bulbs early in spring, before the new leaves push forth, and it is well to place them at least two inches beneath the surface of the soil. After being potted they should be placed near the glass in a sunny frame or greenhouse, where protection from frost is assured. When they commence to grow water may be given, and as the plants develop the water supply should be increased and air should be admitted freely during warm weather, and growth encouraged by occasional applications of liquid manure. The supply of liquids must be gradually decreased as the leaves attain their full dimensions, and discontinued altogether when they turn yellow.

The stock may be increased by seeds and offsets. The offsets are removed from the parent bulbs in spring, and they should receive the same treatment as that recommended for the bulbs. With proper care these offsets may be had in bloom two years later. The large fleshy seeds should be sown in sandy soil when ripe, and only partially covered. They germinate readily in a warm greenhouse if kept moderately dry, and when fit to handle should be potted off and treated as older plants. Seedlings usually flower in their third year.

The one vexing quality of the Belladonna Lily is its habit of producing flowers only after the leaves have died away. Its other attractions atone for this defect to some extent, but cultivators have long been anxious to remedy it by crossing *A. Belladonna* with *Vallota purpurea* and other closely allied plants in which foliage and bloom appear together. Whatever these experiments may have proved for the botanist, they have not as yet improved the Belladonna Lily as a garden-plant.

Cambridge, Mass.

M. Barker.

How to Procure Wild Flowers.

IN cultivating our native wild flowers I believe that many amateurs make a mistake in not procuring for themselves from the woods and fields as many of them as come within their reach, or as they could get by a little exertion. To search them out, at least the rarer ones, and know them first in their natural homes; to lift them with one's own hand and note the soil, conditions, etc., in which they grow, and then to copy them as well as may be in some corner of one's garden or grounds, will give more real gratification than the purchase of established plants from a nursery. There are always peculiarities in the location and surroundings of wild plants that are not mentioned in catalogues and botanical descriptions, and to see just where they grow naturally and study their com-

pany, will give one the clearest idea of the place which will suit them best in cultivation.

Take, for example, the wild Violets, of which almost any New England town contains six to a dozen varieties. The time to distinguish the various kinds one from another best is when they are in flower, and they may be successfully transplanted at this season. Go out into the woods and fields in the middle or last of May and look for them. The work may be novel, but one who sets about it in earnest will soon learn just where to look for them. Lift the finest plants, with plenty of their home soil about their roots, using care that they do not wilt. Keep them moist and shielded from the sun, and when planted out in the garden they may need shading and watering for the first few days until their roots get a firm hold of the soil. Such plants well cared for, set at this season, make strong flowering stock by the next spring. If they are inclined to wilt when first lifted, a third or half of the leaves should be removed, which will considerably retard evaporation, so that the roots can keep up a full water supply. At this early season, when Violets are in bloom, many other fine things will be found, such as Anemones, Trilliums, Spring Beauties, Lady Slippers and Ferns. One who begins to collect will be surprised at the number met with, the pleasure each new find gives, and if properly cared for the small per cent. of losses. There is a pleasure in finding for the first time in bloom, in its natural condition, a strange and interesting plant, which cannot be compared to the enjoyment it gives when first viewed in a garden or greenhouse.

But spring is not the only season to collect these wild plants. Scarcely a day passes from May until December when some of them may not be successfully transplanted. On excursions for plants one is apt to overload with implements. A small and light pickaxe about a foot in length, with a handle fifteen inches long, is the only implement needed for most plants. Of course, there are cases where such a tool would not answer, but they are rare. A tin collecting case with a tight cover will keep plants fresh a long time, but a closely woven handle-basket will in most cases answer just as well, and is much lighter to carry. A wet cloth spread in the bottom and another over the plants will keep them cool and moist a long time.

There will always be many desirable things which can be best procured by purchase, but the grower who buys everything regardless of what is within his immediate reach will lose much pleasant and profitable experience.

Southwick, Mass.

F. H. Horsford.

Transplanting Onions.

AN experiment in transplanting Onions was made last season by Mr. W. J. Green, Horticulturist of the Ohio Experiment Station, the results of which are set forth in the paper which follows, and which was read by him before the Columbus Horticultural Society:

The practice of transplanting Onions when young is not common with gardeners, but it has many advantages which seem to have been overlooked. Seed under forty different names, including about thirty varieties, was sown in the Experiment Station greenhouse February 25th, 1890. The seed came up promptly, and the young plants advanced rapidly in growth, being six to eight inches in height by the middle of April. As soon as practicable two beds or plats of ground were prepared side by side, in one of which the young Onion-plants grown in the greenhouse were planted.

In the other bed seed of the same varieties was sown in the ordinary manner. In all respects, except that of transplanting, the plants in the two beds were treated exactly alike. Both were manured and cultivated alike, and twice during the season, when the weather was dry, both were irrigated. At the proper time the plants in the bed where the seed was sown were thinned, so as to stand the same distance as those that had been transplanted, which was three inches apart in the row, the rows being one foot apart.

The difference in the two beds was very marked from the start. Those that were transplanted commenced to grow at once, none, so far as observed, dying in the operation. Not only were the transplanted Onions much larger at all times during the season, but they had a healthier appearance, besides being more uniform in size. A conservative estimate at any time during the season would have placed the yield of the transplanted bed at more than double that of the other bed.

The difference in cost of cultivation was considerable, the ratio being about one to two in favor of the bed of transplanted Onions. At the first weeding both beds were weedy, but while the weeds were as large as the Onions in the bed where the

seed was sown, making weeding difficult and slow, the task was comparatively easy in the other bed. At the second weeding it was necessary to remove many of the small Onions in the bed where the seed was sown, an operation which is equivalent to an extra weeding. Counting the extra trouble of growing in the greenhouse and transplanting, the work on the two beds was about the same for the whole season—that is, transplanting adds nothing to the cost of growing the crop, aside from the necessity of a greenhouse, hot bed or cold frame, in any of which the plants can be started.

The difference in the time of ripening was about one month in favor of the transplanted Onions, making it possible to use them for bunching, and also to market the crop at an earlier date than could be done with those sown in the open ground. The yield of the transplanted Onions was about double that of the others in most cases, as the following table of some of the leading varieties will show :

Name of variety.	Transplanted.	Not transplanted.
Giant Rocca.....	1,106 bu.	596 bu.
Mammoth Pompeii.....	1,428 "	996 "
Spanish King.....	1,319 "	751 "
White Victoria.....	1,179 "	502 "
Yellow Danvers.....	594 "	398 "
Red Weathersfield.....	779 "	560 "

In the above table the yield per acre is estimated from small plats, and the actual yield on an acre might fall below those given, and yet it is believed that even better results could be obtained by attending carefully to all details in management. It will be seen that the best results and greatest difference in yield were obtained with the foreign varieties. There was a gain with both Yellow Danvers and Red Weathersfield, but less marked than with the other varieties. The greater size and uniformity of the transplanted Onions made the product more marketable in all cases.

The advantages of transplanting Onions may be enumerated as follows: (1) The greater probability of securing a good stand of plants. (2) The saving of labor at the most critical period. (3) Advance in time and maturity. (4) Increase in the crop. (5) Improvement in the appearance of crop, enhancing the market value. (6) The ground is occupied for a shorter period, and therefore it can be occupied by another crop the same season.

This plan may not be feasible for those who grow Onions on a large scale, but it can be followed to advantage by gardeners who do a general market-garden business, and who have the necessary hot-beds or greenhouses. It should be remembered that the foreign varieties with which the above results were obtained are not so good keepers as the varieties commonly grown, but they bring a higher price in the market early in the season.

Ripened Wood Makes Hardy Trees.

I LATELY saw in Woodlands Cemetery, West Philadelphia, a flourishing specimen of *Magnolia fatida* (*grandiflora*) which was nearly twenty-five feet high. I have been satisfied for a long time that it is entirely feasible to have this tree a common one about here if care were taken to plant it in the right place, for there are now several good specimens not far away. But the luxuriance of this one was so evident that it ought to scatter every doubt as to its hardiness. What the tree wants, and what many other so-called "half hardy" things need, is a high, well drained situation, where there will be no unripened shoots when winter comes. Early matured wood is what is wanted, and this the high situation gives. I have seen Deodar Cedars about here flourish well on rocky bluffs with good top-soil. This Magnolia at the Woodlands stands on elevated land not far from the Schuylkill. On its western side is a dwelling house, some thirty feet away; and on every side, though not close enough to prevent its growth, are large deciduous trees, for which this place is famous. Then the numerous monuments about the place also break the wind. Everything tends to make shelter, and if this was given the Magnolia could be made at home in a proper position anywhere in this latitude, so that there is no good reason why the cultivation of this most beautiful and stately of broad-leaved evergreens should not be greatly extended. But the seeds or plants should be had from northern trees, or from those not far south, to have the best chance of success.

In this cemetery, too, as well as in Laurel Hill, are flourishing specimens of the English Holly, a plant rarely seen here out-of-doors. In every case the situation is high, dry and sheltered from the wind and sun. In Laurel Hill I have seen thriving specimens of the common greenhouse shrub, *Azalea*

Indica alba, some of which have been flourishing out-of-doors for many years, yet it is not generally known that this plant is hardy.

Germanstown, Pa.

Joseph Mechan.

Early Chrysanthemums.—Mr. Gerard, in his excellent note in GARDEN AND FOREST for November 19th, doubts whether it is desirable to spend time in the cultivation of the earliest flowering Chrysanthemums, because they are not equal to the best of the late flowering varieties, and illustrates his position by comparing August Celery with November Celery. It may be granted that Celery after hard frost is more crisp and delicate than that which is earliest in the market, and yet many people who are of the same mind cultivate early Celery, and early Celery always sells well in the market. Just so, the early flowered Chrysanthemums may not be the best of Chrysanthemums, but they are beautiful flowers none the less; they are admired by people of taste, and they will always be grown; and even if we can never have the best Chrysanthemums in early September we may have better ones than we now have, and the people who are working to improve these early varieties deserve encouragement and not criticism. A plant of any of the Desgranges, when in healthy condition, as early as the 10th of August makes one of the most effective of all garden plants. Unfortunately, however, not one plant in twenty-five of this variety will maintain a healthy growth from start to finish, because the thin leaves are not able to endure the heat and drought of our summers. But I feel assured that there is a section of these plants, of which M. E. Nichols is the type, which will give us a very satisfactory list of early Chrysanthemums for flowering from the first of September to the middle of October. Chrysanthemums of this type have all the qualities of good garden plants; dwarf growth, shrubby habit, thick, leathery leaves, and flowers of medium size, freely produced on stiff foot-stalks. From my experience I have no doubt that we shall very shortly have a fair showing of Chrysanthemums with these desirable characteristics.

Pearl River, N. Y.

John Thorpe.

Autumn Flowers.—After Sweet Williams were removed from the margins of our herbaceous borders in July we planted a mixture of Calendulas and Viola "Perfection," the former forming a kind of background. The effect has been quite pleasing, and long after the frost cut everything else down these two plants have kept blooming. Everybody knows how persistent the Calendulas bloom during autumn. This Viola, however, has more than kept it company. It may be raised just as easily as the Pansy, and, if anything, is the hardier of the two. I sow a little seed in a cool frame in spring and get plants into blooming condition in June. I then transplant them in the borders wherever needed, where they bloom for the remainder of the summer until late fall.

Wellesley, Mass.

T. D. Hatfield.

Correspondence.

Care in Selecting the Seeds of Trees.

To the Editor of GARDEN AND FOREST:

Sir.—I have been much interested in reading the editorial on the "Improvement of Trees," which appeared in your issue of October 29th. The theory you illustrate by the case of the eastern and western Douglas Spruces, if lived up to and generally adopted, would save many disappointments. About the time the seed of the Colorado Douglas Spruce was planted in Massachusetts I received seeds of this tree collected in Colorado by the late Dr. C. C. Parry. At the same time Burnet Landreth & Sons sent me several pounds of the seed of this tree, gathered on the Pacific side of the continent, to grow for them, as they intended to use the Douglas Fir in their forest-planting in Virginia. The seedlings of both were carefully covered in the autumn of the first year with coarse prairie hay. The seedlings from the Pacific-coast seed were at this time much larger than the others. Both lots grew well the second year; they were planted in the same soil, the Pacific-coast seedlings being in the autumn of the second year still much larger than the others. Each lot of seedlings had the same covering the second winter. When they were uncovered the following spring the Colorado seedlings were as fresh as Norway Spruce or Scottish Pine seedlings of the same age, having wintered perfectly. The Pacific-coast seedlings turned brown wherever they penetrated through the covering of hay, although they were green where they had been well covered. When the time came for them, however, to commence their new growth they all died.

The Douglas Spruce is by no means an exception. I have met with several other cases as marked as the one I have related. Many years ago there was a great demand for Red Cedars for ornamental planting in the west. Many people liked them for hedges. We collected our seeds from native trees growing on the bluffs here. These trees did not, however, produce enough seed to supply the demand, and we ordered five bushels of it from western Tennessee and the same quantity from southern Illinois. We had the same experience as with the Douglas Spruce. The seeds collected here produced hardy trees; the others produced tender trees. At another time Black Walnuts did not fruit well in our county. We gathered what we could find and ordered a large quantity of nuts from southern Illinois. The plants raised from these southern plants made a much larger growth than ours during the first season. The following spring ours were all alive with terminal buds, while the southern plants were killed to the ground and went to the brush-pile. I could cite many other instances as marked, but these ought to be enough to convince any reasonable man that it is necessary to select seeds of trees with reference to the locality where the seedlings are to grow.

Waukegan, Ill.

R. Douglas.

Recent Publications.

The Silva of North America. A Description of the Forest-Trees which grow naturally in North America exclusive of Mexico. By Charles Sprague Sargent, Director of the Arnold Arboretum of Harvard University. Illustrated with Figures and Analyses drawn from Nature by Charles Edward Faxon, and engraved by Philibert and Eugène Picart. Volume I. *Magnoliaceæ—Illicineæ*. Large 4to, pp. ix. + 119; 50 plates. Boston and New York: Houghton, Mifflin & Co. 1891.

It is with a sense of profound gratitude and with the highest admiration for the immense labor devoted to the work that we welcome the appearance of the first volume of this magnificent book. Professor Sargent has been engaged in the accumulation of the material now collated and given to the world for a large number of years, and the result will rank with the works on science and art that are recognized as classics the world over.

The book is sumptuously printed on heavy paper and cut with broad margins. The illustrations are superb, the descriptions are excellent, and the notes on geographical distribution, history and economic importance are of the highest interest and value.

The descriptions of genera and species, which follow the sequence adopted in the "Genera Plantarum" of Bentham and Hooker, are prefaced by an account of the various publications which have been especially devoted to our trees, the earliest being Humphrey Marshall's "Arbustum Americanum," and the most recent noted Professor Edward L. Greene's "West American Oaks."

The author's definition of a tree is certainly the most rational one. He says: "The line which divides trees from shrubs is a purely arbitrary one, and an attempt to separate them is often unsatisfactory. A division based on habit, rather than on size, seems, upon the whole, more easily applied than any other, and therefore less objectionable. So, for the purposes of this work I have considered as trees all woody plants which grow up from the ground with a single stem, whatever size or height they may attain." As to the number of species coming within this definition it is stated "The forests of North America, exclusive of Mexico, are now believed to contain four hundred and twenty-two, besides numerous varieties."

The question of nomenclature is treated of in the following sentences: "I have adopted the method which imposes upon a plant the oldest generic name applied to it by Linnæus in the first edition of the 'Genera Plantarum,' published in 1737, or by any subsequent author, and the oldest specific name used by Linnæus in the first edition of the 'Species Plantarum,' published in 1753, or by any subsequent author, without regard to the fact that such a specific name may have been associated at first with a generic name improperly employed. The rigid application of this rule leads to the change of many familiar names and considerable temporary confusion. But unless it is adopted, anything like stability of nomenclature is hopeless, and the sooner the changes which are inevitable in the future are made, the more easily students will become accustomed to them and acquire a knowledge of the correct names of our trees." This position will be heartily welcomed by almost every American botanist. Indeed, we believe that the publication of this great work on this principle will practically remove all opposition to the method here adopted, and

which some of us have for many years foreseen as the only escape from a very troublesome question.

The following species are described and figured in this volume: *Magnolia fatida*, *M. glauca*, *M. acuminata*, *M. tripetala*, *M. Fraseri*; *Liriodendron Tulipifera*; *Asimina triloba*; *Anona glabra*; *Capparis Jamaicensis*; *Canella alba*; *Gordonia Lasianthus*, *G. Altamaha*; *Fremontia Californica*; *Tilia Americana*, *T. pubescens*, *T. heterophylla*; *Guaiacum sanctum*; *Xanthoxylum Clava-Herculis*, *X. cribratum*, *X. Fagara*; *Ptelea trifoliata*; *Helietta parvifolia*; *Amyris maritima*; *Canotia holacantha*; *Simaruba glauca*; *Kæberlinia spinosa*; *Bursera Simaruba*; *Swietenia Mahagoni*; *Ilex opaca*, *I. Cassine*, *I. vomitoria*, *I. decidua* and *I. monticola*.

The "Silva" will be completed in twelve volumes, to be issued two each year. The price is fixed at \$25 per volume. It ought to find a place in every public library in this country and abroad, and the proprietor of every country-place will be one thing short of complete equipment until a copy of it is within reach in his drawing-room.

Columbia College, New York.

N. L. Britton.

Our New England: Her Nature Described by Hamilton Wright Mabie, and Some of her Familiar Scenes Illustrated. Boston: Roberts Brothers.

We do not often have occasion to speak in these columns of a Christmas "gift-book." But this one has merits beyond those that make the usual example of its class a more or less desirable object to lay on the centre-table. It is a long quarto volume, illustrated by reproductions of photographs from typical New England scenes, beautifully printed as a rule, always interesting in their subject matter, and sometimes—as in the view of the Exeter River, the "Milking Time" and the "Country Road in Summer"—really charming. Unfortunately, however, in a seeming desire to enhance the "decorative" effect of these simple transcripts from reality, each has been printed on a page partly covered with pen-and-ink drawings of the sort which, when etching margins are similarly defaced, are called "remarks." In some cases these pen-and-ink accessories are modest enough to injure the effect of the main picture but little. In other cases, however, they are most unfortunately obtrusive, and they have small merit of their own to excuse their intrusiveness.

But better even than the photogravures is the delightful essay of Mr. Mabie, which, while following lines that have often been trodden—with its four chapters devoted to the aspects and moods of the four seasons—gives us a genuinely fresh impression of New England nature. One passage, as true as it is fresh, runs thus: "First impressions linger long after fuller knowledge has shown them to be mere illusions: and the first impressions of New England were distinctly unfavorable. If the colonists of 1620 had landed in Plymouth Bay in June instead of December the report that went abroad of New England would have conveyed a genial and mellow instead of a harsh and bleak import. The melancholy monotone of the waves breaking on a 'stern and rock-bound coast' would not have lingered in the ear as the dominant note of the New England landscape; nor would short and bitter days and snow-beleagured forests have furnished the atmosphere and background of New England scenery as often conceived by persons at a distance. That December landing was not without obvious advantages in the way of discipline, but it gave occasion for a misapprehension which still exists in many minds. The year in New England has four well defined seasons, and winter is one, not all, of them." This, we repeat, is at bottom quite true. But perhaps Mr. Mabie has not laid the greatest blame exactly where it belongs. It is not facts which impress later generations so much as the report of these facts, and the report which makes the profoundest impression and echoes longest is the report voiced by some form of art. It has been, we think, the poem from which Mr. Mabie quotes which is chiefly responsible for the popular idea, current at home and abroad, with regard to New England as a typically inclement region. Of course, if the Pilgrims had not chanced to land in December, Mrs. Hemans would not have written her thrice-popular verses in the strain she chose. But the fact that she wrote them, not the fact that she had historical excuse for writing them, seems to us the real lion that has stood in the path of a general understanding that New England has delightfully hot summers as well as painfully cold winters. It matters not who writes the history of things—it is the person who sings songs about them, in a way to catch the popular ear, who really moulds popular impressions. And is not Mr. Whittier in this sense another sinner? Why, we ask—we who think the New England summer and autumn the most delightful earth can offer—why did he write "Snow-bound" instead of a

poem called, for instance, "Under Green Apple-boughs" or "By a Blue Summer Sea"?

And this suggests the only fault we have to find with Mr. Mabie himself as an exponent of New England charms. He does not pay enough attention to the charms of her sea-coast. It is delightful and beautiful enough in itself to deserve high honor at the hands of any commentator, and its importance is increased by the fact that these shores only on the whole long reach of our Atlantic seaboard have real picturesqueness and varied beauty. There is subject matter for a dozen essays in the variety which they reveal, from the noble boldness of the coast of Maine to the humble, green, mellow softness of Buzzard's Bay and the adjacent parts, where the breath of the Gulf Stream transports us far enough away from all conventional ideas of "stern and rock-bound coasts" and to the pastoral charm of the broad reaches which face Long Island Sound. May Mr. Mabie be moved by the spirit of these coasts to write another essay wherein their moods and aspects shall be chronicled!

Exhibitions.

Autumn Flower Show of the United States Nurseries.

THE exhibition of flowers and plants which filled the immense ground-area of Madison Square Garden last week displayed in a remarkable manner the resources of a single establishment. The transportation of the collection in covered vans from Short Hills, New Jersey, where the United States Nurseries are situated, is said to have cost Messrs. Pitcher & Manda \$2,000. The principal attractions were, of course, Chrysanthemums and Orchids, but there were great numbers of other green-house plants—Specimen Palms, Cycads and Ferns, arranged in a most effective way, so that the Garden from the upper galleries presented a striking picture. The season was so well advanced that the great mass of Chrysanthemums had passed their prime, but the late varieties were fairly well represented. Fresh blooms every day took the place of those that had faded, and many novelties were introduced as the show went on. An immense flower of a new seedling named *The Tribune* was not shown until Saturday, and several others made their first appearance on the last day of the show. *The Tribune* was grown in a five-inch pot, and the flower, which is closely incurved and whorled, is very deep and substantial. The cut bloom exhibited was about seven inches across and of a rather creamy white, with a few of the very outer florets pink-tinted. Most of the novelties in Chrysanthemums which originated this year at the United States Nurseries have been described in previous numbers of this journal.

The strength of the display as a Chrysanthemum show was in the massing of great numbers of plants, the different colors being skillfully mingled in soft harmonies. A solid square of rich red Cullingfordii and masses of the pure yellow of W. H. Lincoln and Grandiflorum were the most conspicuous.

In the very centre of the arena was a bank of *Cypripediums* by the hundred, with well grown specimens of *Adiantum Farleyense* scattered among them, while behind them rose tall Palms, and above them hung great numbers of epiphytal Orchids. The richness of this collection of *Cypripediums* will be understood when it is known that on a stage not far away there were 135 distinct varieties in bloom.

At the eastern extremity of the display was a striking group of fruit-plants, Bananas, Pineapples and other Bromeliads, with Agaves and Cacti rising from a carpet of succulents. Scattered among the collection and almost lost in the great variety were many rare and interesting specimen plants. Among these we may note *Phoenix Roebelinii*, figured in GARDEN AND FOREST for June 4th, 1890, and a wonderful specimen of *Zamia pungens*, which was much admired. Among the best Orchids were fine examples of the white *Lycaste Skinneri*, *Lalia Autumnalis alba*, *L. Eyermannii*, *L. Gouldiana*, *L. Arnoldiana*, *Phajus Blumei*, *Cypripedium Ashburtonia expansum*, *C. Harrisianum superbum*, *C. magniflorum*, *C. Masereelianum*, *C. Schroderae*, *C. Leucorhodum*, *C. Tonsum superbum*, *C. cardinale* and Charles Canham. Besides these there were many such oddities as the Cocaine-plant, the Cinnamon-tree, the Telegraph-plant and the Cayenne Pepper-plant.

The exhibition was largely attended during the entire week, and the question was often asked: "If a single firm can make such a creditable display, why cannot the Horticultural Society of New York have exhibitions which would be worthy of this great city?" Flower lovers go from here to Philadelphia and Boston to enjoy the displays there every spring and autumn.

There is no lack of commercial growers in this neighborhood, and there are admirable private collections, and yet but for the enterprise of such firms as Pitcher & Manda and Siebrecht & Wadley no flower show could be seen here from one year's end to another.

Notes.

At the annual meeting of the Pennsylvania State Forestry Association, held in Philadelphia last Friday evening, Rev. Dr. J. P. Lundy was chosen President. Addresses were delivered by Mr. B. E. Fernow, Chief of the Forestry Division of the Department of Agriculture, Mr. Herbert Welsh and Mr. Burnet Landreth.

Azalea Indica (Robert le Diable) is described by the *Illustrirte Gartenzeitung*, of Vienna, as a new variety, first exhibited by Monsieur V. Cuvillier last April. It has "enormously large single flowers, strikingly characterized by their rare orange-cinnamon color, which is enhanced by a large black spot, with metallic reflections, that covers more than half the flower."

If the accounts in Russian papers are true, horticultural shows in St. Petersburg are not conducted on very scientific principles. At an exhibition of orchard-fruit and flowers which was held last October it is said that 500 prizes were distributed, one at least falling to almost every exhibitor; and one man was rewarded for some fine apples which he confessed to having bought on the market place, never having owned or cultivated a garden in his life.

Part of the money appropriated not long since for the establishment of small parks in Brooklyn will be at once expended for a pleasure-ground in the Eighteenth Ward. It will be bounded by Knickerbocker and Irving Avenues and by Starr and Suydam Streets, and will contain 104 city lots, measuring 25x100 feet, which will be paid for at the rate of \$1,000 a lot. It is proposed to call the spot "Stranahan Park" as a merited compliment to the citizen who was chiefly instrumental in the establishment of Prospect Park some thirty years ago.

The International Exhibition, which is to be held in the island of Jamaica, will open on January 27th, 1891. A horticultural display will be among its chief features, and will doubtless prove of great interest to northern botanists and horticulturists. Persons desiring to exhibit in any department should communicate with Mr. T. T. Stokes, of 44 Boylston Street, Boston. Through the good offices of Mr. L. D. Baker, of Jamaica, who is President of the Boston Fruit Company, it has been arranged to transport free of charge all exhibits from the New England States.

The "Report on the Progress and Condition of the Botanic Garden in Adelaide during 1889," recently published by Dr. R. Schomburgk, the Director of the garden, says that South Australia never had such favorable, abundant rains as during the year in question. The Roses suffered, indeed, from excessive moisture and then from excessive heat in the months of November and December, but the carpet-beds flourished wonderfully. Among the plants which had promised well were the new Japanese food-tuber, *Stachys affinis*; the new Mexican Vine, *Vitis Mexicana Mocin*; *Agave Sisalina*, the plant which furnishes Sisal-fibre, and *Lathyrus silvestris*.

According to a correspondent of *The Tribune* the groves of English Walnut, just coming into good bearing in Anaheim, Los Angeles County, produce from \$400 to \$500 per acre. Only twenty-seven trees are planted to an acre, but each tree will yield \$20 worth of nuts. Nineteen years ago Fresno County was a desert. Wheat could not be raised even on the valley land, because of the excessive drought in summer. In 1871 the first irrigating canal brought in 500 settlers. These have now increased to 25,000 colonists, while land formerly held at \$2.50 per acre now commands from \$50 to \$500 an acre. The county now has sixteen canal systems, 300,000 acres in grain, 20,000 in vineyards and 3,000 in orchards.

An account of Rangemore Hall, near Burton-on-Trent, the estate created by the famous brewer Bass and now occupied by his son, Lord Burton, was recently published in the *Gardeners' Chronicle*, and gives an idea of the extent of glass which may form a feature of a great English establishment. The houses are all heated from one boiler-house, which is sixty feet below the level of the gardens. Grapes are grown in six houses, Peaches in seven, Figs in two, Cucumbers in two, Strawberries in one, Tomatoes in one, and Melons in two; those for flowers include one for Azaleas, one for Camellias,

one for East India Orchids, one for Cattleyas, one for cool Orchids, one for Eucharis, two for Carnations, two for Gloxinias, and two for Cyclamens; to these must be added a stove, a fernery, a propagating-house, a conservatory, and eight pits for various flowers. Twenty-six gardeners care for these houses and the grounds, and the unmarried men among them live in a comfortable house in the gardens, which is provided with a well stocked reading-room and a horticultural library of 300 volumes.

It is said in a late number of the *Daytona* (Florida) *Messenger* that in many parts of Florida old Indigo-fields are still to be seen, together with vats, drying-houses, store-houses, etc., but for some reason, perhaps because the preparation of Indigo into a marketable article was expensive and unwholesome, the cultivation of this plant has been suspended. The annual export of indigo from the southern states once amounted to about 1,000,000 pounds, but now there are only a few places in Georgia and South Carolina where it is cultivated at all. The Department of Agriculture is making efforts to introduce the cultivation of this plant again into Florida and Louisiana, where, under improved methods of preparation for market which materially lessen the cost of the operation, it ought to prove profitable. The plant requires a moderately rich soil and is ready to cut about three months after the seed is sown. The coloring matter does not exist as indigo in the plant, but when it is steeped in water and subjected to certain processes the blue color is brought out.

Mr. L. Paparelli, who came last year from Italy to assist Professor Hilgard in the Experiment Station at Berkeley, has prepared a statement for Olive-growers in California concerning the methods of pickling the fruit employed in Italy. The olives must be picked by hand some six weeks before they reach maturity. The usual process is to steep them in a solution of caustic soda at the rate of about five ounces to a gallon of water. After soaking a few hours soft water is poured upon them several times until it flows away clear, when the fruit is placed in kegs of brine consisting of one ounce of salt and thirteen ounces of water for each pound of olives. When they are preserved without lye the olives are placed in a wooden vat and submerged in pure water covered with Lemon leaves. The liquid is changed every hour for a month, after which the fruit is placed in vats, with first a layer of salt, then one of olives, then salt again, the proportion being twelve pounds of salt to a hundred pounds of olives. After remaining in the salt for two days clean water is added, and another layer of an inch of salt is placed on top, and in a month after this treatment they are fit for use. The olives are improved by placing aromatic herbs like Fennel among them after the first treatment.

Fuller, the author of the famous "Worthies of England," published about the middle of the seventeenth century, says with regard to the gardens of Surrey: "Gardening was first brought into England for profit about seventy years ago, before which we fetched most of our cherries from Holland, apples from France, and had hardly a mess of rath peas but from Holland, which were dainties for ladies, they came so far and cost so dear. Since gardening has crept out of Holland to Sandwich, Kent, and thence to Surrey, where, though they have given £6 an acre and upward, they have made their rent, lived comfortably, and set many people to work. Oh, the incredible profit by digging of ground! for though it be confessed that the plow beats the spade out of distance for speed (almost as much as the press beats the pen), yet what the spade wants in the quantity of ground it manureth, it recompenseth with the plenty of food it yieldeth, that which is set multiplying abundant-fold more than that which is sown. 'Tis incredible how many poor people in London live thereon, so that, in some fashion, the gardens feed more people than the field." The reference in the last sentence is evidently to the market-gardens which already abounded in districts that are now a solid part of London, but were then purely suburban in character—Battersea, for example, and Bethnal Green.

Professor Cook, of Michigan College Experiment Station, has been continuing experiments with the Plum Curculio, and comes to the conclusion that while spraying with the arsenites may be at times successful, it is not always so. Some small trees heavily loaded with fruit were sprayed last season, and though no rain washed the poison away, in less than a week all the plums were stung. Professor Cook therefore concludes that the old reliable method first suggested by the father of Mr. J. J. Thomas, the well known pomologist, remains the surest, cheapest and best method of banishing the Curculio from Plum orchards. With this process the Curculio may be allowed to work until it has sufficiently thinned out the fruit,

thus rendering the grower a conspicuous service, after which the jarring can begin and the remaining fruit can be saved clean, large and sound. If the fallen fruit is gathered every day under this process the work will be less and less every year. The mallet with which the trees are struck should be well padded, and, even then, unless great care is used serious damage may be done to the trees. In some cases a spike is driven into the tree, and then an iron or wooden mallet without a pad may be used, or a limb may be sawed off to receive the blow. Professor Cook thinks it would pay fruit-growers to set Plum-trees thickly among other fruit-trees. The Curculio prefers the plum, and will therefore leave apples, cherries and peaches untouched, and the enemy can be fought on the Plum-trees alone. In this way not only a profitable crop of plums can be secured, but the other crops are protected with no other extra expense.

The death in Paris of Dr. J. Triana, the distinguished botanist of New Granada, at the age of sixty-two years, is announced in the last issue of the *Revue Horticole* which has reached us. For ten years he explored the flora of his native country as a member of the Scientific Commission directed by Codazzi, and then established himself in France, where the position of Consul-General of New Granada enabled him to reside, for the purpose of describing his collections. His work, however, was always hindered and finally had to be abandoned for the want of financial support from his Government, and his "Prodromus Floræ Novæ-Granadensis" did not proceed beyond the *Sapindaceæ*. Triana was associated with the late Dr. Planchon in the publication of many of his new species. He published, too, important memoirs on the *Guttiferae* and upon the *Melastomaceæ*. Monsieur Triana, in spite of the numerous discouragements he had to encounter in the last years of his life, never ceased to interest himself in the plants of his native country, and in their applications in medicine, in the industrial arts, in horticulture and agriculture. He was a foreign member of the National Agricultural Society of France, and left many devoted friends in France.

In the death of Mr. Shirley Hibberd, which occurred somewhat suddenly on the 16th instant at Kew, horticulture has lost one of its most devoted apostles, and his country an earnest worker who was always in the van of every movement, horticultural or agricultural, intended to promote the interests of either, and of the community at large. For nearly forty years Mr. Hibberd stood in the front rank among English horticulturists, having from the time when he was quite a young man, up to within a few hours of his death, devoted himself with an ardor equaled only by his ability to the affairs of the garden. Experimental gardening was his passion, and it is not too much to say that the present high position of English horticultural art is largely due to Mr. Hibberd's careful experiments, keen observation and thorough teaching. Vegetables of various kinds, fruit, Roses, Pelargoniums, Chrysanthemums, Ivies, besides many other plants, were collected and cultivated by him solely with a view to improvement in the plants themselves, by crossing and selection, or in the methods of cultivation. Mr. William Watson sends us an appreciative estimate of Mr. Hibberd's capacity and attainments, from which we extract the following: "He was a most successful teacher. As a writer and lecturer on horticultural subjects he had no equal. He spoke from experience; his knowledge of his subject was thorough; he rarely theorized. While possessing a deep and wide knowledge, he also possessed to a remarkable degree the art of conveying it to others both by writing and orally. I never heard a speaker who was better able to inspire one with enthusiasm, to work one up to the highest pitch, to carry one along with him, than Mr. Hibberd. It is probable that his success as a speaker and writer was largely due to the zeal with which he pursued various other subjects besides those which he preferred to be publicly identified with. His knowledge of poetry, for instance, was exceptional. A lecture on Shakespeare which he delivered in Kew scarcely a year ago astonished by its cleverness even those who knew that Shirley Hibberd was no ordinary man. He probably knew every line of Tennyson's best poems. I have heard him, when discoursing on Tennyson, recite portions of the 'Idylls of the King' and 'In Memoriam' in such a way as showed pretty clearly that he had them all by heart. His originality, earnestness and clear-headedness, his restless energy, manliness and downright good nature were shown in everything he did. Among the many eminent horticulturists whom death has claimed this year, the one whose place cannot easily be filled is Mr. Shirley Hibberd. He was born in 1825, was married twice, and leaves only a little daughter of six years behind him."

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Protection of the Yellowstone Park.

IT is to be hoped that Congress will take some definite action this winter on the bill now before the House of Representatives for the enlargement, protection and maintenance of the Yellowstone Park. The preservation of the national park is a matter in which a large number of people throughout the country feel a deep interest and patriotic pride. They believe in its preservation for the purposes for which it was originally set aside, and at the same time realize its importance from an economic point of view. Thousands of citizens have memorialized Congress for the passage of some measure looking to its better protection.

The park is a high plateau with an average elevation of nearly 8,000 feet, surrounded on nearly all sides by mountains rising from 2,000 to 3,000 feet above this broad tableland. Numerous streams from the high mountains pour their waters into the park, from which, by means of three large rivers, the greater part of it leaves this elevated country for the more arid regions below. Hundreds of lakes, many of them of large size, lie scattered over the plateau. Yellowstone Lake, one of the grandest bodies of water in the world at so high an altitude, presents a magnificent natural reservoir twenty miles in length, with a breadth, across its greatest expansion, of fifteen miles. Two large rivers, the Yellowstone and the Snake, find their sources in these lakes and mountain recesses. In all the vast Rocky Mountain country there are few, if any, areas of equal extent so admirably adapted for a national forest-reservation, and none which present greater advantages as a natural reservoir for the storage of water. Over eighty per cent. of the park country is covered with a coniferous forest. For the collection and preservation of this water supply the forest of the park and the adjacent territory is of incalculable value. It is indeed a prime necessity. The importance of this water in an arid region,

and one with a constantly increasing population, cannot be overestimated. It is safe to say that without the forest and with the diminished water supply, which would naturally follow, the grand scenic effects of the park would be wholly wanting. The geysers, hot springs and water-falls would be despoiled of their charm.

At the time the park was originally set aside as a pleasure-ground for the people the boundaries were very loosely defined, the country being almost a *terra incognita*. With our present knowledge of the physical features of the region these errors can easily be rectified. The proposed bill enlarges the park to the south and west, including a large area of forest-covered mountains now wholly unprotected. These mountain lands are useless for agricultural and grazing purposes, but they are invaluable as the sources of the main streams and the feeders of the Yellowstone Lake and Snake River. Besides its economic value, this proposed extension of the reservation would give to the park picturesque valleys and bold panoramic scenery, both of which it now in a great measure lacks.

A bill to meet the present requirements of the park has been before Congress for eight years. It has passed the Senate four times, only to be lost in the House. In the present Congress a carefully considered bill has passed the Senate, and has been reported to the House from committee with one or two amendments. No objection whatever is raised to the proposed enlargement or the provisions made for the punishment of criminal offenses committed within the reservation, the two most important objects of the bill. Yet the bill is again liable to fail of becoming a law owing to a small but persistent lobby, who are determined that it shall not pass without an amendment granting an exclusive privilege to a railway company to lay fifty or sixty miles of track in order to reach Cooke, a small mining camp lying just outside the north-east corner of the park.

Those interested in the park, for many obvious reasons, object to the admission of any railway. They see in such an admission the beginning of the end. They are quite willing to adjust the northern boundary so as to allow not only the railway but traffic of all kinds to reach the mines without going through the reservation. This object can be easily attained by making the Yellowstone River the north-eastern boundary, an excellent physical feature which all could recognize. Curiously enough the Montana Mineral Railway Company, the corporation asking for this franchise, objects to this adjustment of the northern boundary, because, as they say, it would allow any railway to build to Cooke. What they really desire, it seems, is an exclusive privilege which the proposed amendment would give them, and without which they oppose the bill. It is far better that people along the line of the railway should live under state jurisdiction rather than reside within the reservation. The people interested in Cooke, who consider a railway essential for the development of their property, prefer that the track should run wholly outside the park. They are becoming irritated at the delays caused by the small number of individuals who, for their own personal ends, object to any modification of the boundary and insist upon the railway running through the park.

Since the matter was first agitated in Congress large tracts of the country which it is proposed to add to the park have been devastated by forest-fires either maliciously or carelessly started. Large herds of elk, deer, sheep and moose have been wantonly slaughtered for their hides by skin-hunters. By those qualified to give an opinion, it is stated that the country immediately south of the park, which it is proposed to add to it, is one of the favorite breeding places of the elk. Secretaries Lamar, Vilas and Noble have each in their annual reports urged the passage of a similar bill to this one now before Congress. It is certainly not too much to ask of Congress that they take some action in this matter and protect from vandalism of all kinds this most valuable forest and game reservation.

THE New York Society for Parks and Playgrounds was recently incorporated at Albany. Its President is the Hon. Abram S. Hewitt. Among its Trustees are Dr. Felix Adler, Mr. De Witt J. Seligman and Mr. Andrew H. Green, and among its other incorporators are Bishop Potter and Mr. Erastus Wiman. These names we cite from a much longer list to show that neither sectarian nor political influences will control the new organization, but a pure desire on the part of representative citizens of all kinds to promote the welfare of the poor children of New York. One of the Trustees, in an interview reported in the *New York Sun*, says that the first object of the Association will be to obtain a greater number of suitable places in our larger parks where children of all ages will be allowed to play and can be provided with inexpensive amusements like heaps of sand and swings. Then vacant lands will be rented for temporary playgrounds in various localities, and an effort will be made to obtain an exemption from taxation for such lands. Below Fourteenth Street, where unimproved lots can hardly be found, play-houses will be established to take, as far as possible, the place of open grounds. The city authorities will be influenced to provide without delay the small parks in thickly populated districts which were authorized by the act of 1887 while Mr. Hewitt was Mayor; and arrangements will be made for sending bodies of children to the parks in summer under proper control and guidance, so that their diversions may be healthful and safe. To secure competent superintendence for the different play-grounds will, of course, be one of the most difficult tasks of the Society; but the aid already promised by Mr. D. J. H. Ward, the instructor of Dr. Adler's well known school, and by such experienced teachers as Professor Woodhull, promises well for success in this direction. The good which this Society may do is incalculable, and it is to be hoped that it will have generous support. Much more will be secured than the temporary amusement and the physical improvement of poor children. Such influences as will be brought to bear upon them ought to have a far-reaching effect upon the development of their characters and their intelligence, and these proposed playgrounds, and the devoted teachers who will superintend them, may rescue many little ones from lives of degeneracy and crime.

There is little fear that the united judgment of the organizers of this movement will countenance any project which may be objectionable. A few zealous friends of the children seem to forget that there are larger people who have equal need of playgrounds, and they are urging some very destructive changes in the design of Central Park. It will not be necessary to sacrifice the beauty of the park, which means its highest usefulness, to make provision for the children. Park ground is a necessity as well as playground, and the growing city must have more of both.

Private Grounds and Enclosures in Cities and Towns.—I.

THERE is a strong contrast between American and European ideas as to the character and function of private grounds, be the area surrounding a house large or small. In Europe the idea is that of seclusion; in the United States it is rather one of inclusion. In Europe the space surrounding the dwelling is treated as an out-door extension of the dwelling itself; a high wall encloses it, and so sacred is its privacy that the gaze of a stranger into its precincts is held as something to be guarded against almost as rigorously as actual trespass. Not only is this the case with country or suburban grounds, but in England, in cases where city houses chance to have an area of a few yards between their fronts and the street, this space is also habitually shut in with a high and solid wall.

With us, the ground surrounding a dwelling is treated, in effect, as an intermediate territory; a transition between the freedom of the public way and the privacy of the household. This character has been intensified, rather than diminished, of late years, with the growth of wealth and æsthetic culture in our country. In our suburbs the tendency is toward the removal of all barriers, not only between the house-grounds and the street, but also the elimination of all boundary marks

between the grounds of adjacent dwellings, giving the houses of a neighborhood the appearance of standing in a space common to them all.

It would be an interesting task to trace the reason for this radical departure from the domestic traditions of our race in the Old World, but it might require a research in the province of sociology so extensive as to forbid present consideration. Our democracy undoubtedly has something to do with it. While possibly a minor motive may be the indulgence of a love of display, harmless in such a manifestation, this characteristic seems more likely to proceed from an intuitive recognition of the fundamental fact of a democratic commonwealth: That the individual is a portion of the public, to which he owes the duty of sharing, so far as he may, the enjoyment of the things of beauty that he may be privileged to possess.

There are desirable elements in both systems, and it would be an excellent thing could the best features of each be combined. The American custom contributes largely to the adornment of the town or city; the placing of dwellings in such relations to each other and to the public creates an atmosphere of frankness, of hospitality, and of neighborhood friendliness and freedom. It also cultivates the virtue of voluntary respect for private rights and privileges, and it is notable that in communities where this absence of bounds and barriers prevails, the abstention from trespass is, at least, as marked as where walls, hedges and fences forbid passage. Exclusiveness is a habit not native to Americans, and in our out-door life there is little disposition to avoid the public gaze. Upon our private grounds it is customary to play at tennis, croquet and other games with entire indifference to lookers-on from the adjacent highway.

Yet there is a great charm in a "close"; in an open place securely walled or hedged about, where members of the household may enjoy the open air in the same seclusion that exists within the walls of the dwelling. An advantage of such a feature, besides its retired character, consists in the possibility of its use at times and seasons when resort to the more open grounds might be inconvenient or uncomfortable. There is more likelihood of shelter from winds that in an exposed situation would be unpleasant at times; and this shelter would enable its use on pleasant days both earlier in the spring and later in the autumn than would be practicable otherwise. It is true that the broad piazzas peculiar to the better class of rural dwellings in this country largely answer to purposes of this nature, yet in certain respects they do not fully serve as substitutes for the "close."

The treatment of this feature should, of course, be quite different from that of open grounds; its service as an out-door portion of the dwelling should be markedly recognized in a more formal treatment, possibly combining the garden, the bower, and a suggestion of the conservatory, with the free use of tender and tropical plants in ornamental pots. Some sheltered angle beside or behind the house should be chosen, with careful reference to prevailing winds and to the sun, and the enclosing wall could easily be made a pleasing feature of the architecture of the house.

Boston.

Sylvester Baxter.

The Autumn Flora of the Lake Michigan Pine Barrens.—I.

IT is the good fortune of botanists and admirers of our native plants who live at Chicago to have within a short distance of the city a region as yet but little disturbed by the hand of man. A ride of a few miles takes one to a Pine-barren and a succession of sand hills and dunes extending around the head of Lake Michigan to Michigan City and beyond. And one can hardly avoid entertaining the hope, even at the expense of the owners of the property, that it will remain in this condition for some time to come. Though factories and dwelling houses have sprung up in the woods and swamps, one can still roam over spots where towns only exist on maps and in the minds of speculators. And since the value of the land to the cultivator is slight, though yielding fair returns to the market-gardener where the sands are not shifting, the prospect of speedy settlement is not bright. The scanty timber spared by numerous fires and springing up in their track is mainly composed of Pines and Oaks, with Cedars, Poplars, Birches, Tupelo and Sassafras in localities suited to their growth. The western part of the region is low and generally swampy, the long ridges of sand rising but slightly above alternating sloughs running parallel with them and the shore of the neighboring lake. Eastward the wind has piled the sand into hills, the depressions among them being dry or occupied by ponds and swamps. There is much less regularity in

the surface structure than in that of the western part. The hills are mostly held in position by a scattered growth of trees and shrubs and plants characteristic of the sand dunes, except near the shore, where the wind piles the sand into great drifts, which often change their form and position. There is a rich variety in the plants of the whole region, when we take into account the entire season of growth, although the conditions of soil and moisture, and the modifying influence of the lake, are very variable. It is the autumnal flora of the western or more typical Pine-barrens which I purpose to notice in its most striking feature, as seen in the month of September. From the eighty to one hundred plants whose season is autumnal or reaches over into autumn, I have selected the following as most characteristic.

The Golden-rod claims more than a dozen species; two of these are the most abundant, each in the place most suited to its growth. *Solidago nemoralis* grows throughout in the dry grounds, its grayish stem and leaves according well with the color of the ground beneath. *S. Ohioensis* takes the grassy borders of the sloughs or the moist and open spaces, which it clothes with stretches of yellow, often of great extent. It is a smooth plant, about two feet high, with narrow leaves, the radical pretty long; the stem is terminated by a showy corymb from two to six inches in diameter. Close by the lake is a peculiar species, *S. humilis*, or this species running into the variety *Gilmanii*. It is confined to the ridge of sand that skirts the shore, and is very local in this respect. The flower-heads are large, few in number and nearly sessile along the upper part of the stem. Several stems, some of them three feet long at times, usually spring from the same roots and rise obliquely in different directions. One of the handsomest kinds is *S. speciosa* or its variety *angustata*. They bear a long thyrselike panicle of bright flowers, with the smooth stems densely covered by thick leaves, making a very sleek looking plant. These occasionally branch at the top, forming a cluster of thyrsoid panicles. They are found in the driest situations, and when massed, as they sometimes are, the effect is very showy. *S. Riddellii* is a companion of *S. Ohioensis*, but is much less seen in the barrens than in prairie regions. It has a corymb much like that of the latter, but more compact. It is very distinctly marked by its narrow, conduplicate leaves, sheathing the stem at their insertion and gradually curving away from it. Fine specimens of *S. rugosa* are also found here, well distinguished by its peculiar rugose leaves from the allied species, *S. ulmifolia*, seen also in the regions clothed with Oaks and White Pines.

The most showy plants upon the ridges are two species of *Liatris* or Blazing Star, *L. scariosa* and *L. cylindracea*. Then in the same localities as *Solidago Ohioensis*, *L. spicata* is abundant. All bear very bright, bluish purple flowers, crowded along the upper part of the stem. *L. spicata* has a dense spike of heads, individually smaller than those of the others, but so compact and covering the stem to such a length that its top is a cylindrical mass of bloom, contrasting well with the yellow of the more humble Golden-rods around it. *L. scariosa* bears a similar spike, but it is not generally as long, though the heads are larger, but less closely placed. *L. cylindracea* is the smallest of the three, with a few but prominent heads, having a long, cylindrical involucre. The most symmetrical of them is *L. spicata*; its numerous linear leaves, long near the ground, shorten so gradually that the plant tapers very evenly from the base to the beginning of the spike. *L. scariosa* has the handsomest inflorescence, not only on account of its larger heads and flowers, but its buds, often furnished with bright reddish purple scales. Their season of blooming does not agree throughout. *L. cylindracea* and *L. spicata* begin to flower about the same time, but the latter lasts considerably longer. *L. scariosa* starts later and goes on into October. The first of these is out of flower when the last is at its best, and when the top of the spike of *L. spicata* wears a withered and rusty look. This last feature detracts from the beauty of a *Liatris*, since the mode of inflorescence being from above downward, the withered flowers are more obtrusive than if the heads unfolded the opposite way. This is specially remarked when the spike is long, for a stem ending in buds is more attractive to the eye than one ending in dead flowers, or, in most cases, in fruit. An additional charm is provided for the flowers of *Liatris* on sunny days in autumn, since they are selected almost exclusively for the visits of the large Archippus Butterfly (*Danaüs Archippus*, Fabr.), hundreds of whom are seen flying overhead or lighting on the flowers to sip their nectar, gently opening and closing their many colored wings while busied in this act.

The principal Aster of the early fall is *A. ptarmicoides*. It is exceedingly abundant, and everywhere specks the

dry grounds with white corymbs. A few plants of *Euphorbia corollata* still linger upon the ridges to contribute to this effect, just as earlier in the season they had been equally numerous and effective in whitening the same ridges. Sometimes *A. linearifolius* will be found a common plant on some of the ridges. It reaches about the same height as the former, but is more showy, its larger heads having violet rays. Though each stem commonly bears but a single head, they are apt to obviate their lack of effect in this regard by producing several stems from the same root. Another denizen of the dry grounds is *A. sericeus*. Its heads are large, with rays of violet-blue. Its small but shapely leaves, covered with a silky pubescence, making them as soft as mouse-ears, and its silvery look, render it one of the most elegant of our Asters, though it is a small plant. The three range from one to two feet high. In early fall *A. umbellatus* is common in wetish grounds. Its heads of white flowers, though few-rayed, are quite large, and in sufficient number to make its corymb prominent amid the clumps of low bushes where it most delights to grow. Its elongated leaves, tapering and finely shaped, help to make it an attractive plant. About this time *A. multiflorus* is seen in the dry soils, with small but profuse flowers, rendering it a mass of white. Its grayish stem and leaves give it a well defined appearance. It is not uncommon to find the stems two or three feet high at the time of flowering, bare of leaves below and bushy-branched above, showing little but flowers, the small and scale-like leaves upon the branches buried in the profusion of blossoms. *A. ericoides* has similar heads, but they are more scattered on the branches, so that it is much less effective in appearance. Here it is generally not so stout a plant as *A. multiflorus*, its stems being rarely more than twenty inches high and very slender. It frequents damper and often more grassy situations. In the latter part of the month of September, and on into October, *A. azureus* is one of the most abundant as well as the finest Aster in the Pine-barrens. Its range of ground is considerable, being equally at home in that which is not too moist, as well as in dry ground, in open places and also in those somewhat shaded. It adapts itself to prairies and open woods, though more common in the former. The color of the flowers is quite variable, and consists of all shades from azure blue to violet-purple. In fact, the violet shades often predominate. The stems frequently turn purple, and the leaves sometimes, especially in the full sunlight. It is about three feet high, branching freely and loosely above, bearing medium sized heads, frequently in such quantities as to bend the rather slender stems to one side, nor does it drop its lower leaves as much as many Asters do at the time of flowering; these are so variable in form as to make its identification quite puzzling at times. There are several Asters along the margins of the ponds common and characteristic, such as *A. Tradescanti*, *A. vimineus*, *A. junceus*, flecking the coarse Grasses and Rushes, and the changing leaves of the low shrubs, with spots of pale purple and white. In the course of the fall the Asters will equal or exceed the Golden-rods in variety, coming later into bloom and lasting for a longer time.

Englewood, Chicago.

E. J. Hill.

Plant Notes.

Some Recent Portraits.

The *Gardeners' Chronicle* issued on November 15th contains a figure of *Chrysanthemum Indicum*, made from a specimen collected by Dr. Augustine Henry "on rocks in a mountain of coniferous wood at an elevation of 8,500 feet above the sea-level at Yin-Yü-Ho in the Fang district of Hupeh. The flowers are yellow. At this altitude the plant is very graceful, delicate, and small in stature. It has quite a different aspect from the plant which occurs in ditches and valleys along the banks of the Yang-tse, near Ichang, at levels of under 1,000 feet." This interesting plant is already in cultivation in England from seed collected by Dr. Henry, and although the seedlings have not yet flowered, specimens were exhibited by Mr. Sutton at the Chrysanthemum Conference of the Royal Horticultural Society held in London last month. It is of special interest, inasmuch as it probably represents one of the original wild forms from which the modern garden Chrysanthemum has been derived. According to Dr. Henry's notes, reproduced in the pages of our contemporary, "the Chrysanthemum is known to the Chinese as the Chü-hua; and dried flowers of certain cultivated kinds are much used in medicine and form a considerable article of trade, there being an annual export of eighteen tons from Tientsin, twenty-two tons from Hankow and thirteen tons from Ningpo. The Ningpo variety,

known as Hang-chü, because it comes from the adjacent Hang-chow prefecture, is a yellow-flowered variety and sells at three times the price of the other kinds. The so-called Sweet Chrysanthemum is exported from Canton to the amount of three tons yearly, and the flowers are probably like those of some plant like *Cotula anthemoides*."

Monsieur André, in the issue of the *Revue Horticole* for November 16th, describes, with the aid of an analytical drawing of the flowers and a beautifully colored plate of the fruit here reduced to one-half its natural size, an interesting Brazilian plant of the Cucumber family, *Sicana odorifera*, which has been cultivated by our correspondent, Monsieur Naudin, the great authority on this family, in the garden of the Villa Thuret at Antibes, where the fruit which served for the illustration in the *Revue Horticole* was produced. This fruit, which is bright orange-scarlet in color, narrowly ovate and ten or twelve inches long, is exceptionally ornamental and possesses a penetrating and agreeable odor. It is the Curuba or Curua of the Brazilians, and is used by them to perfume their houses. It is edible, also, when cooked, although the flavor is not agreeable to every one. According to Monsieur André it recalls a combination of mushrooms and apple-marmalade.

The *Sicana* has been known for 150 years to science, having been discovered in 1636 by the German physician, George Marcgraf, who had been sent to Brazil by the Duke of Nassau to explore the coast-region between the Rio Grande and the Pernambuco. Pison, the famous Dutch naturalist, was associated with him in his scientific explorations, and between them they discovered the Curuba and published the first description of it. Later it received from Vallozo the name of *Cucurbita odorifera*, and it was Naudin, with abundant material at his disposal, who was able to discover characters which enabled him to establish his genus *Sicana*.

Sicana odorifera has long remained the only species of the genus. Monsieur André, however, now calls attention to a second species, of which fruit has lately been received in France from Paraguay, and for which he proposes the name of *S. atropurpurea* on account of the dark violet color of the fruit, which resembles in external appearance that of a large egg-plant. The fruit is much larger than that of the Brazilian species; the seeds are larger, longer, rhomboidal and not oval, with the basal appendage oblique. The ripe fruit is also used by the Paraguayans to perfume their dwellings. These two plants, which are perennial, the first with stems extending for a distance of twelve or fifteen feet, can be grown probably in our southern states, where the fruit would prove a conspicuous ornament in gardens.

New or Little Known Plants.

The Pelican-Flower (*Aristolochia grandiflora*).

THE remarkable flower, one of the very largest known, reproduced in the illustrations of the present issue was grown at Bordentown, New Jersey, by Mr. E. D. Sturtevant, who communicates the following note with regard to it:

"About a year ago a wealthy amateur residing on the Hudson River sent me some vines under the name of the 'Duck-plant,' or '*Aristolochia Pelican*.' It was said to be new, and I was unable to find any description of it in the Gardeners' Dictionary or in the catalogue of any nurseryman. Upon inquiry at Kew I was informed that it was not in cultivation there, but that it had been described and figured in the *Botanical Magazine* under the name of *Aristolochia grandiflora* or Pelican-flower. This plant has proved easy of cultivation and rapid in growth with me. In December of last year a young plant was placed in a good sized box of rich soil in a warm greenhouse. This plant in June had made a growth of twenty feet and began flowering. Many buds are now (October 1st) well developed and one is open. At first sight the plant reminds one of a large Morning Glory-vine. The flower-buds, hanging pendent in different stages of growth, form certainly one of the most remarkable sights in the vegetable world, and cannot fail to cause exclamations of wonder from persons seeing them for the first time. The resemblance to the form of a duck or pelican is very close, the head, bill, neck and body being plainly outlined. The fully developed bud measures fifteen to eighteen inches in

length, and is as large as a good sized duck. This is exclusive of the long tail-like appendage. One flower fully expanded last June measured twelve by eighteen inches with forty-two inches of tail, making the total length sixty inches. At the time the bud opens the tail assumes a spiral form and appears to be intended as a ladder for the use of insects seeking to reach the flower. The centre of the flower appears like purple velvet, the inside of the throat being lined with hairs turned downward, and intended, apparently, to prevent the return of the insects caught within. The open flower, unfortunately, emits a fetid and very disagreeable odor, but this is not perceptible before it expands. I find that this plant flourishes in good loam mixed with old manure or other fertilizers. It may be planted out in a warm greenhouse or grown in a tub which can be kept in the open air during the summer and taken in before frost."

*Aristolochia grandiflora** was first described by Swartz in one of his works on the plants of the West Indies published more than a century ago. Patrick Browne found it in Jamaica and published a short account of it in his work on the natural history of that island under the name of *A. scandens*, giving to it the vernacular name of Poison Hog-meat from the reputed poisonous properties of the plant. Tussac, who published an excellent colored plate of the flower, relates that a whole herd of swine had perished from eating the roots and young stems of this plant. Lunan, in the "*Hortus Jamaicensis*," appears to have first given it the appropriate name of Pelican-flower, stating that "the plant is so abominably fetid that it is detested and shunned by most animals; yet when hogs venture by necessity to eat of it, it destroys them."

A. grandiflora is now known to be widely distributed in the West Indies, and extends to Central and South America, where it is by no means rare, occurring along the banks of streams usually in low, rather moist situations. It was introduced into cultivation from seeds sent to Kew from Jamaica by Mr. Purdy. It flowered at Kew in 1848, when excellent figures of the flowers were published in the *Botanical Magazine* and in other periodicals. It appears, however, to have soon disappeared from gardens, and Mr. Sturtevant's plants are the only ones, so far as we have any knowledge of the matter, which have flowered in gardens in recent years.

The figure of the fruit which appears on page 597, the first which has been published, has been prepared from a specimen collected last winter in Guatemala by Mr. John Donnell Smith, of Baltimore, to whom we are indebted for the opportunity to reproduce it.

Foreign Correspondence.

London Letter.

TINTED GLASS.—The behavior of plants when grown under colored glass has been the subject of protracted experiment at Kew. About thirty years ago some of the most important houses were glazed with glass more or less tinted with green, from the belief that this would conduce more to healthy and vigorous growth than the clear glass generally used. The ferneries were glazed with glass several shades deeper in color than the other houses for which green-tinted glass was preferred. Ferns have always been exceptionally numerous at Kew, many of the species being rare and extremely delicate. Probably the value of the collection of Ferns was the reason for the deeper shade of green in the glass used. Evidence which told against the green-tinted glass had gradually accumulated until last year it was decided to replace it with clear glass in a portion of the large tropical fernery, the reconstruction of the roof offering a favorable opportunity for making the change. The result has been most remarkable, the growth made by the plants under the clear glass being much better

* *Aristolochia grandiflora*, Swartz, "Fl. Ind. Occ.," iii., 1,566.—Tussac, "Fl. des Antilles," i., t. 27.—Spreng., "Syst.," iii., 752.—*Bot. Mag.*, 4,368, 4,369.—"Fl. des Serres," iv., t. 351, 352.

A. scandens, P. Browne, "Nat. Hist. Jam.," 329.

A. gigas, Lindley, *Bot. Reg.*, t. 60.

A. cordiflora, Mutis, HBK., "Nov. Gen. et Sp.," ii., 118.

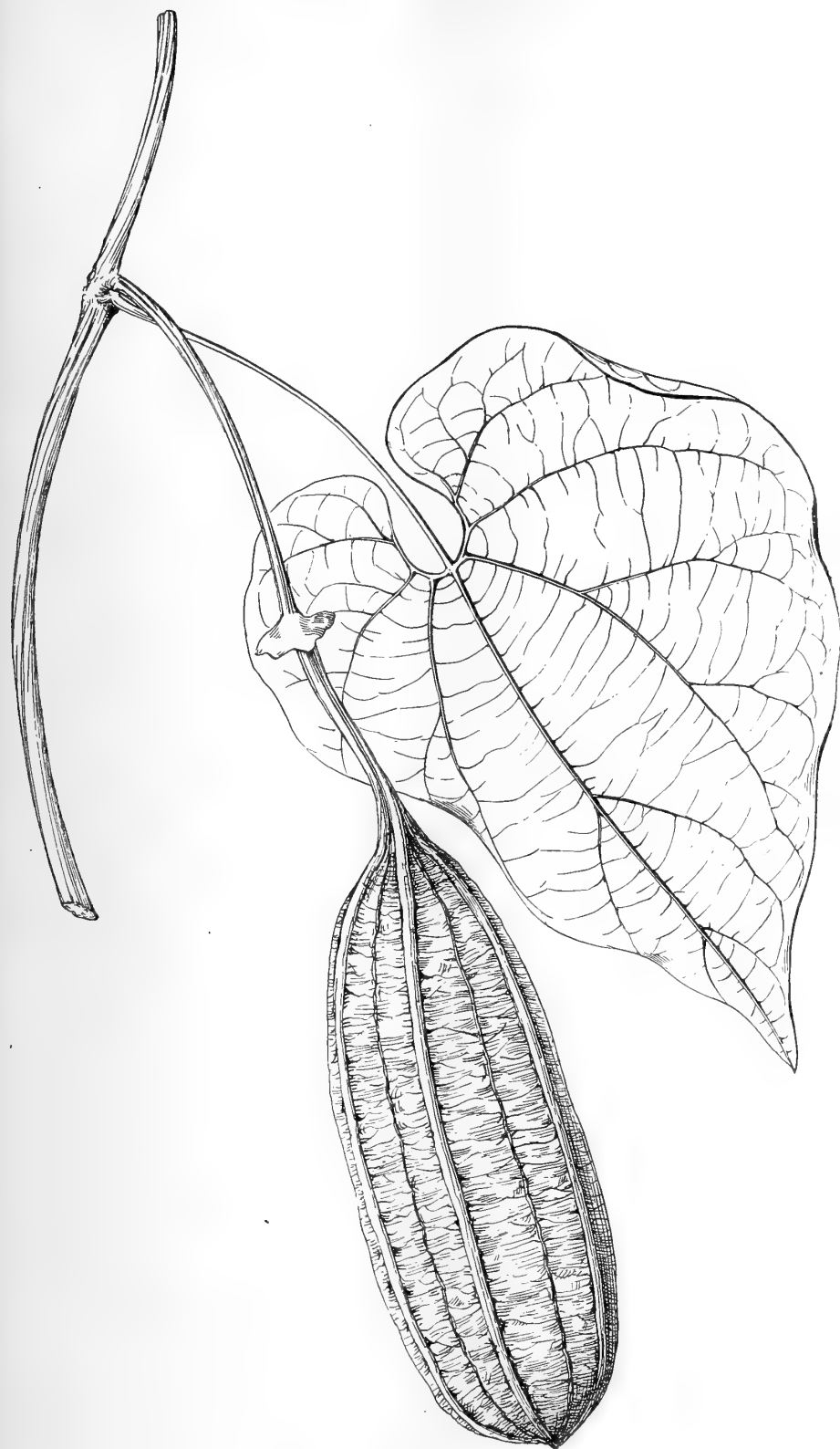


Fig. 78.—A Fruit of *Aristolochia grandiflora*, natural size.—See page 596.

than that of the plants under the green. The objection urged against the latter was a practical one—namely, it darkened the house in the winter, when all the light possible was required by the plants, while in summer it did not give sufficient shade to dispense with the use of blinds. Besides this, moreover, many plants also failed to grow under the green glass, although in houses glazed with ordinary glass they were satisfactory. Such were some *Adiantums*, some of the *Gymnogrammes*, *Platycentrums* and others. These plants are now in very fine health in exactly the same positions as they failed in before the glass was changed. Several years ago it was decided to use only clear glass in repairing the other houses. I cannot just now

lay my hands on the reasons advanced by the scientists for the use of green glass in preference to clear, but I believe they were to the effect that the former transmitted exactly the kind of light under the influence of which plants grew best. This light was a sickly green, which, although not displeasing in its effect on the appearance of the plants, gave to the human countenance a peculiarly unpleasant hue.

It has taken nearly thirty years to practically demonstrate the unfitness of green-tinted glass for horticulture, and now these same results have been arrived at by Professor Henslow by scientific experiment. In a paper read at the last meeting of the Linnæan Society the Professor stated the results he had obtained by experimenting on the growth of plants under the influence of glass tinted red, yellow, blue and green, as well as under clear glass and in the open. Of these the green proved not only worse than the clear, but worse even than the red, the yellow or the blue! The best results were obtained from plants grown in the open, which is precisely what every practical man knows must be the case. If the temperature will admit of it, then all plants are better outside than when under glass. The second best results were shown by plants grown under clear glass, and here again practice is at one with the Professor. Blue proved worst after green, then red and then yellow. I have never seen red or blue glass used in horticulture, but what is considered bad glass has a yellowish tint. It all comes to this, then: pure light is best of all for plants, and the next best is that which passes through the medium that least obstructs it—namely, pure clear glass. Of course the intensity of the light is another matter. Horticulturists who use green stipple as a summer roof shade for greenhouses must substitute blinds or a white stipple if they desire to have the best results. This is a matter which deserves attention.

NITRATE OF SODA.—This bids fair to become a most valuable manure in the garden. I have seen it largely used both this year and last for Palms, Pandanads, Cycads, Aroids and other ornamental leaved plants, and invariably the results have been most gratifying. No manure that I have seen used, not even cow manure, in which I have great faith, has produced such immediate effect in the growth, vigor and full color of foliage. Mr. J. J. Willis, writing in the *Gardeners' Chronicle*, maintains that it is a most valuable factor in the production of vegetable crops and fruits. He strongly recommends it for Strawberries, Celery, Cabbages, Onions, in fact for all kitchen-garden produce. But he recommends it to be used in conjunction with ordinary manures. He says: "It may be stated that nitrate of soda is not regarded as a substitute for other manures. Taking horticulture as we find it, we recommend nitrate of soda as the cheapest and best form in which to apply nitrogen to plants. To those who are using ordinary stable manure we say, continue to use it, but use nitrate of soda in addition. . . . With few exceptions, all the fertilizers now generally used, in proportion to the wants of the plants, contain a larger proportion of phosphoric acid, potash, etc., than they do of available nitrogen. If we desire to raise maximum crops, therefore, we must furnish available nitrogen, and the cheapest and best form in which to get this nitrogen is by nitrate of soda." Nitrogen, however, is no more a substitute for other plant food than potash is a substitute for nitrogen.

Kew.

W. Watson.

Cultural Department.

Another Year Among Grapes.

THE grape season of 1890 proved no more satisfactory in any important feature than the two preceding ones. The variations in different vineyards but a few miles apart in the behavior of the same variety have been remarkable, and were probably due to the condition of the vines at certain stages of the weather. The Rosebug, which devastated the vineyards of south Jersey, has not yet proved serious here, though the number on my vines this year was twice as large as it was last year; but my practice is to kill every one found, if possible, which will, I hope, tend to postpone an invasion against which I shall be powerless. Aside from the leaf-roller, I have had less trouble with insects than usual. Frequent rains and dull weather at the time of blooming did more harm perhaps than any other cause. To this I attribute the imperfect fertilization of the flowers, which exceeded all past experience. A friend but a few miles distant reports his Concords exceptionally good, while mine were never a more complete failure. My theory for this difference is that a few days' difference in their blooming season gave to one vineyard good weather for pollination and bad weather to the other.

Fungi, as usual, were abundant, but bagging heads off the rot, if applied early enough; and spraying with sulphate of copper, has kept the mildew in check, so that damage from these sources has been inconsiderable. We now fear these enemies much less than heretofore, but an old, and as yet unconquerable, foe made an invasion which brought more widespread ruin than our vines ever before suffered. This is the Anthracnose, a Fungus that attacks the young growth of the Vine as well as the fruit. In slight attacks the young cane is only discolored, and they partially outgrow the disease, but seldom, if ever, fully recover. In this stage many persons would not recognize it. A grape-grower of long experience visited me this season, and he could hardly be persuaded this was an early stage of the contagion. He only recognized it after it had developed and ruptured the tissues of the bark, showing its black spots, and had stunted or killed the young canes. As yet no certain remedy for this Fungus has been found. This disease should be a subject of experiment by our scientific students and practical grape-growers, and an effectual remedy will be as welcome as was the cure for mildew.

The labor of combating insects and these Fungi, together with low prices for the fruit, renders grape growing for profit less enticing than formerly, and where all of these difficulties

abound it is not strange that some growers are abandoning the business. When we consider that some varieties are much more liable to fungous attacks than others, it is a debatable question whether they are not more likely to appear and more virulent when they do come in vineyards containing a large number of varieties than where there are fewer. The test of a Vine's resistant qualities among a large number of varieties would be more satisfactory than if it were planted by itself.

The Vine-grower has other trials than those arising from insects and plant diseases. He must study the public taste, and the consequent demands of the market. A grape good enough for me to eat is good enough to sell, but among more than fifty varieties I find some I could not put in either class, although they are highly extolled in other sections. I add some notes on the relative value of different varieties according to my experience.

To commence with, Moore's Early, among the black Grapes, is of fair quality and size, but not very productive. It is followed by Cottage, a more vigorous and productive variety, and equal to it, if not better, in quality. Then comes Worden, larger and better than all. If it only had the skin of the Rogers' Hybrids it would be about perfection in its line. Concord, belonging to this class, will have to follow here, though with the purchasing public ninety-nine out of every hundred, and many dealers as well, regard all black grapes as Concords, and buy and sell them as such. About the same proportion of the public know but two pears, Bartlett and Seckel, and call for them at all unseasonable times. Of other black grapes that will keep longer and are better in quality, I name Wilder (Rogers' 4), Aminia (39), Barry (43), Herbert (44) and Merrimac (19), in the order named.

Of red grapes, Brighton is early and excellent, but liable to set poorly; Lindley (Rogers' 9) is open to the same objection, and so is Rogers' 32. A vine or two of Delaware I keep for its intrinsic excellence, and Berckmans will probably prove an acceptable substitute. Among the Rogers' Hybrids there is much confusion. The

Aminia was so named by Mr. Bush, of Missouri, because it was one of two varieties received under the same number. I have two distinct varieties, both received as No. 32, and it is not an unusual thing to get two or three kinds in an order of twenty-five vines of the same variety, though obtained from the most reliable sources. Some of these hybrids so closely resemble each other that an error of this kind would easily escape detection among the black kinds, but when some of these turn out to be red ones the mistake is pretty palpable.

Among white grapes Niagara far surpasses all the rest. Pocklington rots and cracks badly and is too foxy. Martha is a poor apology for a grape, though the vine is vigorous and



Fig. 79.—Side View of a Flower of *Aristolochia grandiflora*, much reduced.—See page 596.

hardy. The clusters and berry are both small. The Lady is larger in berry, earlier and much better in quality, but the vine is a slow grower and unproductive, the clusters are small, and the berries crack and rot as soon as ripe. Lady Washington,

goes also. How it can be so highly extolled as it is by some good men I cannot conceive, unless it is altogether a different Grape with them from what it is with me. To look at the vine in wood and foliage it appears to be wild enough to deserve the

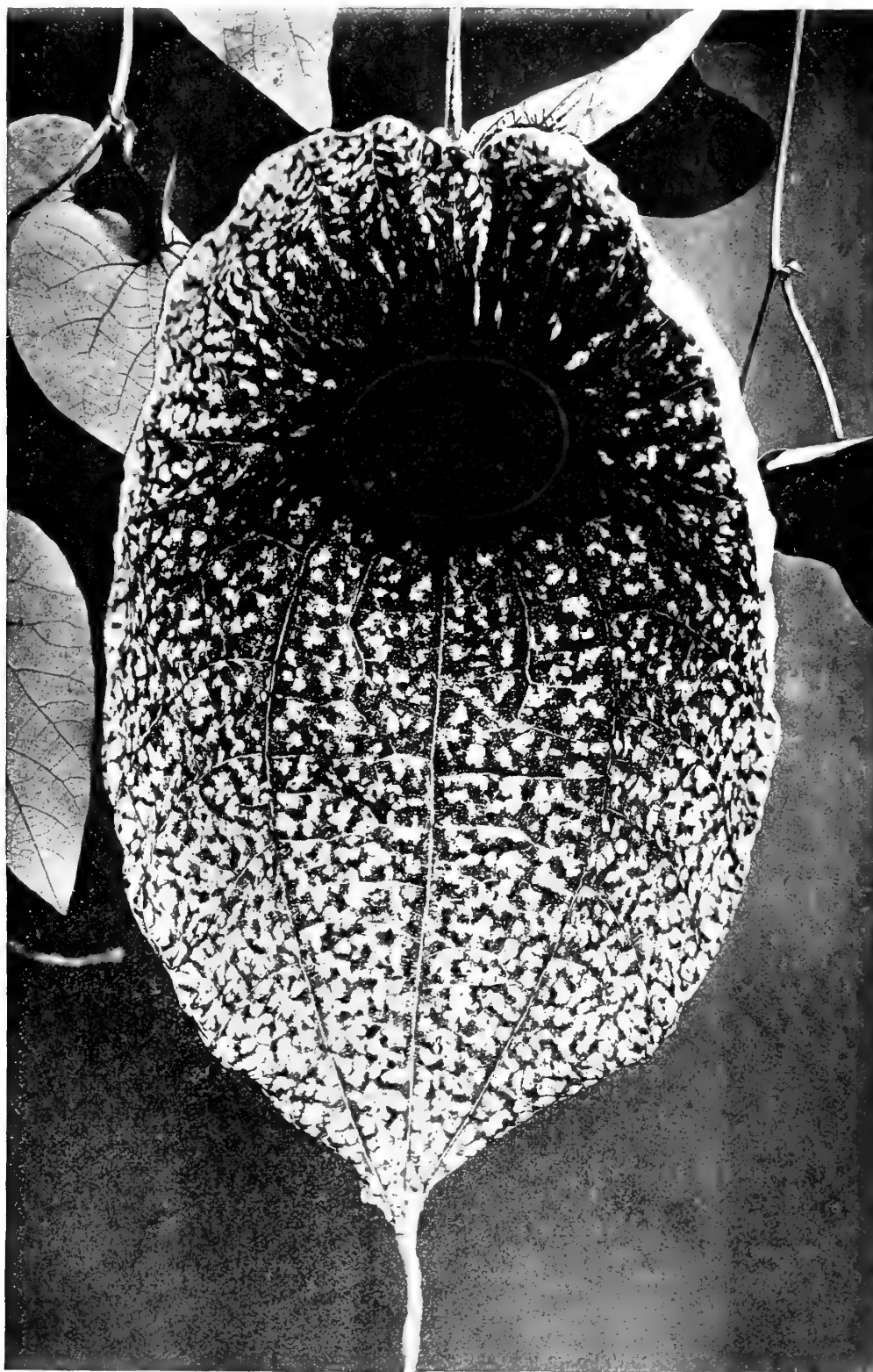


Fig. 80.—A Flower of *Aristolochia grandiflora*, much reduced.—See page 596.

with thinning and extra care, might give some satisfaction. Prentiss is too uncertain. Elvira, Pearl, Grein's Golden and Missouri Riessling are too poor for table use, although they may answer for wine in the west, but with me they are marked for grafting another season if possible. Noah, Jefferson and several others are to share the same fate. Woodruff Red

name of iron-clad. It is productive, too; the clusters are of medium size and very compact, the berries are large, but they rot and crack before ripening, so that often half of them are wasted, and when they do ripen they are but little better than the Champion. Of a dozen vines I have, all but one or two are to be grafted with better sorts. Another highly commended

variety, Early Victor, is about as near worthless with me as any of the list. The vines are vigorous and healthy enough, and the grape itself is good, but the cluster and berry are too small. In this respect it falls below the Delaware, and anything below or equalling that in size must be of superior excellence to become popular.

Of recent introduction, Munson's Brilliant is among the promising red ones. The cluster and berry are of good size, and the quality seems up to the standard.

Montclair, N. J.

E. Williams.

Tritonias.

THOUGH the Tritonias are less graceful than the Ixias and less brilliant than the Sparaxis, they are, I think, the most desirable for general cultivation of the smaller Cape bulbs. They are more vigorous than the Ixias, and never, like them, damp off when half grown. They lack the vivid contrast of scarlet, yellow and black with which some kinds of Sparaxis dazzle us, but they will give three flowers for every one Sparaxis yield, and these are quite showy enough, ranging from vivid orange-crimson to pure white. With Ixia and Sparaxis failure is fully as probable as success, but with Tritonia no one need miss a bountiful supply of flowers.

As in other genera of the Iris family, there is much confusion as to the species of Tritonia; probably more than half of those who have *T. crocata* call it the orange Ixia, while other sorts have been ranked with *Gladiolus*, *Montbretia*, etc. It is to be hoped that Mr. Baker's long-promised work on this family will soon be issued, so that we may have an authoritative guide. I have cultivated many of the species of this genus, and find most of them to vary much from seed without hybridizing, which, all will agree, adds a new charm to a plant, for no one will dispute as to the pleasure with which we see a new flower unfold whose counterpart no one has ever beheld. Some of these are so lovely that I shall name a few of them after speaking of the species as far as I have knowledge of them.

T. crocata is the best known of all, and, with its spike of brilliant orange flowers nearly two inches across, is showy enough to suit the most exacting. Like the other kinds it is excellent for cutting, as all buds will open, one by one, in a vase of water; this kind looks particularly bright and attractive by artificial light. *T. miniata* and *T. deusta* differ but little, horticulturally speaking, from *T. crocata*. *T. hyalina* of Linnæus is generally found in the Dutch catalogues under the name of *T. fenestrata*, given to it by Jacquin. Both names are applicable, and have reference to the fact that, at the base of the segments, color is lacking, and the tissues are transparent like windows. The general color of this species is lighter in shade than that of the other kinds. *T. squalida* is a very beautiful sort; its color is white, shaded at the tips with rose. This is regarded as a distinct species by all the botanists, and distinct it must therefore be, yet I have repeatedly raised it from pure seed of *T. crocata*. *T. scillaris* is less vigorous than the other species, but is very beautiful, bearing numerous bright rosy flowers, which, however, are much smaller than those of other kinds.

The plant called by some *T. aurea*, and by others *Crocisma aurea*, may as well be mentioned in this place. It is probably well known to nearly everybody; but, for the benefit of a possible few, I may say that it is a summer blooming kind, best treated as we treat *Gladiolus*. *Aurea* is a singularly inappropriate adjective to apply to its deep orange blossoms. It makes its new corms at the end of underground runners several inches long. When the bulbs are lifted they will be found to have more or less of these runners, without any bulbs at the end, but looking much like the pestiferous Witch Grass. These ought by no means to be removed, for they will retain their vitality until planting-time, and will then go on without delay, whereas had they been cut off there could have been no blossoms except from the old corm until new runners had grown, which would have shortened the flowering term two or three weeks. It is commonly said that in the autumn, when we lift the corms, the old ones, those we planted in the spring, ought to be discarded because they will never grow again. This is an error; they will grow again, but their growth will be comparatively unproductive of flowers. There are two varieties of this plant, *Maculata*, which, I believe, grows wild in Caffraria, and *Imperialis*, which we owe to the zeal of Mr. Max Leichtlin, or, rather, shall owe, when it is generally distributed.

T. crocata varies in its wild state, four or five well marked varieties being recognized by botanists. It varies even more in cultivation, some of the best sorts being Copper Chief, a very strong growing variety of a coppery red; Lady Rose, pink salmon ground, flecked with crimson; *Maculata*, flesh color,

with deep crimson centre; Rubens, white, with carmine centre; Striata, pink segments, with median stripes of scarlet; Brenda, beautiful shade between rose and salmon; Bellala, segments alternately flesh color and scarlet; Hermosa, bright rose centre with salmon scarlet tips; Galatea, white, flecked and marbled with light purple; Fuego, fiery scarlet; Peach Bloom; Fenestrata speciosa, very light buff, externally light orange. Many others might be named, but enough has been said to show between what limits the colors may vary and to give an idea of the desirability of the genus. Some years ago I hybridized the white form of *Freesia refracta* and *Tritonia crocata*. Singularly enough the resulting plants bore flowers which were *Freesia* pure and simple, though the *Tritonia* was the seed parent.

Canton, Mass.

W. E. Endicott.

Cattleya maxima.

THIS species, although by no means common, is nevertheless frequently seen in collections. It flowers from October to November, and is a fitting companion for the late flowering forms of *Cattleya labiata*. The pseudo-bulbs are more or less club-shaped and compressed, varying in length from six inches to two feet, and are furnished with a single oblong leathery leaf six to twelve inches long and about two inches broad. Some specimens are now flowering in the collection of Mr. R. H. Measures, of Streatham, bearing two or three flowers on a peduncle which springs from the top of the pseudo-bulb, enveloped at the base by a large sheath. I remember, however, seeing several plants in bloom in October of last year, and some of the peduncles had as many as ten large flowers on them. The lanceolate-acuminate sepals and the much broader, oval-oblong, wavy petals are of a beautiful satiny rose color, through which the netting of the veins may be seen, thus adding a further adornment to their appearance. The lip is tubular, much crisped at the edges, and having the same ground color as the sepals and petals, but beautifully marked with a network of deep, rich purple lines, which are closely arranged on each side of the bright yellow band, which extends down the throat and is very conspicuous.

For more than a hundred years *Cattleya maxima* has been known to scientists through the labors of Ruiz and Pavon, two Spanish botanists, who first met with it near Guayaquil, on the Andes of Peru, about the year 1777. It was not, however, until 1842 that *C. maxima* found its way alive into Europe. This was accomplished by the Royal Horticultural Society, who had sent their collector, Theodor Hartweg, out to South America in search of new plants. He first met with *C. maxima* near the banks of the Rio Grande de Melacatos, in Ecuador, where it was growing on rocks and trunks of trees. Plants were sent home, and the first flowers appeared in the Society's gardens at Chiswick in the year 1844. From this time until 1855 no trace of the plant is to be found until a pale-flowered form appeared in the collection of Mr. W. G. Farmer, of Nonsuch Park, Cheam, Surrey, and formed material for a figure in the *Botanical Magazine*. Since this period, thanks to the importations of Veitch, Backhouse, Low, Sander and others, *C. maxima* has become an established plant.

There are a few varieties known, such as Alba, having white flowers with purple reticulations on the lip on each side of the median yellow band; Aphlebia, rarely seen, and characterized by the absence of the purple lines on the lip; the variety Peruviana, commonly spoken of in gardens, which comes from Peru, and is noted for its deeper colored flowers, with more numerous and darker lines on the lip.

The cultivation of *C. maxima* (which, by the way, the late Professor Reichenbach once called an *Epidendrum*) is not difficult. The plants like a warm, moist house, such as *Dendrobiums* grow in, and will thrive in the usual compost of rough peat and sphagnum in well drained pots. They begin to grow in the autumn, at the same time as the flowers are borne on the previous year's pseudo-bulbs, and will consequently require attention as to watering during the winter months. According as the new growths appear, and the new roots begin to push through the soil, the quantity of water may be correspondingly increased. In the summer, when the growths are ripening, as much light and air as is consistent with safety should be given, so as to have the plants thoroughly mature by the autumn.

Isleworth, London.

John Weathers.

Lonicera quinquelocularis, a native of northern India and the Himalayas, can hardly be called a highly ornamental plant when there are so many others possessing greater merit; but it is interesting on account of the profusion of fresh, clear, almost transparent fruit which it bears in the late autumn

long after the leaves have fallen. It is the only hardy bush Honeysuckle here which ripens and retains its fruit in perfect condition so late in the season. The black seeds are plainly visible within the pulp, which is somewhat mucilaginous and disagreeably bitter to the taste. The pubescent, ovate, pointed leaves are from one to two inches in length, and the flowers are small and of a light yellowish white color. In well drained and moderately sheltered situations the plants are quite hardy in this latitude, and may grow as large as the more showy flowering Tartarian Honeysuckle.

Among the climbing Honeysuckles the shining black fruit of the popular Japanese species (*L. Japonica*) is too much hidden by the evergreen foliage to be conspicuously ornamental, but at this date (November 27th) a large proportion of the fruit of *L. Sullivanti* is still full and fresh looking and of a bright red color. No other climbing deciduous species appears to keep its fruit in a fresh state so late in the season.

Arnold Arboretum.

J. G. J.

Correspondence.

Early Chrysanthemums.

To the Editor of GARDEN AND FOREST:

Sir.—It is true, as Mr. Thorpe states in his reply to my note on September Chrysanthemums, that they will continue to be grown, but even his well known passion for these flowers does not seemingly lead him to claim much beauty for the varieties which we at present possess. It is gratifying, however, to be assured from such an authority that advances are being made in this class of plants. Some of Mr. Thorpe's early flowers were very promising this year, but only renewed tests and propagation (seemingly one of the greatest trials) will prove their value. Skillful hybridizers like Mr. Thorpe have secrets beyond the ordinary grower, and yet it is difficult to understand how varieties of which M. E. Nichols is the type are to be hastened into bloom a whole month earlier than their natural season. As a type they seem to lack the very early maturation which, with quick bud development, brings Madame Desgranges into bloom so early. The mid-season kinds seem to differ from the November ones only in the quicker development of buds, as both classes of plants form buds at same time usually.

It is hardly a legitimate occasion for criticism that any one finds pleasure in growing any flowers at any season, but, speaking for myself, Chrysanthemums are flowers to be enjoyed only in their proper character and relations. To me Chrysanthemum means profusion of bloom and great masses of color, and these, I find, can only be fully enjoyed in late October and onward. As a fancier I can appreciate flowers at any time; as the owner of a garden I find my greatest pleasures in the blooming of my flowers in their normal seasons. In a well stocked garden one instinctively separates the seasons on certain shifting lines. Certainly the emotions awakened by flowers at one season are entirely different from those produced at others. The Chrysanthemums are glorious on a frosty morning; they seem brighter and firmer in the keen air, and my pulse always beats faster, and it is always with pleasant excitement that I go among them then, to enjoy the masses of bloom and inhale their camphorous odor. What an antithesis to the earliest flowers of spring, whose sudden awakening, stimulated by the first warm rays of the sun, must, even to the most unemotional, bring a pleasure at once exquisite and sober as the mysterious forces of reviving nature are made evident! As the seasons advance the reflective gardener has with each a different set of emotions gratified. To paraphrase Mr. Warner, the gardener needs all the consolations of these pleasures.

Elizabeth, N. J.

J. N. Gerard.

Cycles of Fruit Growing.

To the Editor of GARDEN AND FOREST:

Sir.—The culture of the sour Cherries has greatly declined in the older sections of America. The cause was the prevalence of black knot. This disease has now almost entirely disappeared, and there is no reason why there should not again be a great planting of this most wholesome fruit. If only a few trees are set by scattered cultivators there will be no fruit saved from the birds. There should be a special movement on the part of nurserymen to encourage Cherry-planting. The sorts most advantageous for the general grower covering all the northern states are the Early Richmond, the Mayduke, the large Montmorency, and the common sour Cherry, from which the Richmond and Montmorency have been improved. These are entirely hardy, and could well be grown for their beauty in blossoming season. Percival Lowell's description of Cherry

worship in Corea and Japan is peculiarly fascinating. These Orientals go out in crowds at the time of Cherry blossoms, and also in Plum season, and, sitting under the trees, sip tea, write poems and become as sentimental as lovers. But aside from the flowers, the beauty of the fruit is beyond that of any other tree, and there is none more wholesome.

The time of depression for the Quince is also about over. Forty years ago it was grown very largely in the northern states. Then the borer attacked the trees and whole orchards were obliterated. The cutting of forests also made our climate subject to sharper changes, which made more protection needful for semi-tender fruits. For the last thirty years Quince-growing has been confined to a few localities. Prices have ruled very high, so that a good acre of Quinces will realize profits beyond any other fruit. Seven dollars a barrel has been the average price of first-rate quinces in this market. But the borer is gone or nearly gone; and we know how to prevent his ravages. Now, there is common sense in a general planting of this fruit once more. The requisites of success are a southern or south-eastern exposure, and protection, natural or artificial, against the north-west winds. I always bind my trees with stalks, straw or hay while young and keep them well mulched. A Quince-tree to thrive must be well fed, but not over-fed. Use coal ashes abundantly about the trees.

Another fruit that should come back about now is the currant. I think that in proportion to the population we do not have half the currants that were grown in 1850. The twig-borer is gone, and the currant worm is very easily managed by two sprinklings of hellebore. The market for this delightful fruit is never overstocked.

When I was a boy there were four fruits specially abundant: plums, currants, cherries and quinces. No one imagined they could get on without them. They had their cycle of growth, then a cycle of decadence; now we may replant. The plum is already finding its old place, but the quince, cherry and currant are scarce. Our only chance of successful competition with birds and insects is to plant enough for both the birds and ourselves and together whip the insects. We cannot succeed without an alliance with our friends in the air. The probability of their multiplying beyond reasonable numbers is very slight, except in such an abnormal case as the English sparrow; but we must furnish them food.

Clinton, N. Y.

E. P. Powell.

The Forest.

Systematic Timber-cutting in Quebec.

THE following remarks are translated and condensed from a paper presented in French to the American Forestry Association at its meeting of September 2d, 1890, by Mr. J. X. Pirrault, Secretary of the Quebec Forest-Association:

Now while the destruction of the state forests is carried on so systematically that it is possible to foretell the fatal moment when the province of Quebec will be stripped of its most valuable forest-trees, it is a public duty to make a last appeal to the patriotism of the men who govern us to put an end to the vandalism of which we are every day the witnesses.

For more than a century the public domain has been pillaged with the thoughtless consent of the state. What was once the finest forest-property in the world has been ruined by pasturage, and by the wasteful methods of lumbermen who, not content to make enormous fortunes at the expense of the Province, have cut and destroyed everything in their path without thought of the future.

Our neighbors in the United States have acted with the same want of forethought, but with this difference, that with a population ten times larger than ours the destruction of their forests has gone on more rapidly. Never, perhaps, in the history of any people has there been seen the administration of a public domain so criminal and so disastrous.

The forests of the United States, from the Atlantic to the Pacific and from the frontiers of Mexico to those of Canada, cover 450,000,000 acres. The annual cutting over of 25,000,000 acres gives on an average 4,800,000,000 cubic feet of lumber. The railroads use, in addition, 500,000,000 feet, the mines 150,000,000, fences consume 500,000,000; 150,000,000 feet are exported, while 18,000,000,000 feet are consumed as fuel. The whole forms the enormous total of 24,000,000,000 feet, of an approximate value of \$1,000,000,000—that is to say, more than the total value of the crop of wheat, rye, oats, potatoes, cotton and tobacco produced in the United States, and thirty-three per cent. more than the value of all exportations of every kind from that great country.

It is hardly conceivable and yet it is true that no forest-administration has been charged with securing intelligent

management of this colossal property. It has been truly said that the real riches of a country are not in its deposits of the precious metals, but in its forests, and yet, thanks to the folly of the Government of the United States, these fruitful sources of public wealth have been allowed to perish without any thought beyond the morrow.

Some idea of the enormous traffic which springs from forests of the United States may be gathered, perhaps, from the fact that in Chicago alone the 2,000,000,000 feet of wood and lumber which are handled in that market represent 1,000-car-loads for every working day in the year. If all the forest-products of the United States were moved by rail, we should have a train equal in length to eleven times the circle of the globe at the point of its greatest diameter. The northern states alone produce two-thirds of this lumber each year, or about 20,000,000,000 feet, worth three hundred millions of dollars. This represents a weight of 500,000,000 tons, and would require a fleet of 500,000 vessels, each of 1,000 tons burden, to transport it—that is, a tonnage equal to twice the fleets of the entire world.

This forest-wealth of the United States has been so used and abused that already the richest forests have disappeared. The pine of Michigan, Wisconsin and Minnesota, once considered inexhaustible, exist no longer. They have been exterminated; and this is readily understood when it is remembered that a single mill in this region has cut half a million feet a day, and that the capacity of all the mills of the United States is more than 60,000,000,000 feet a year. According to the Census report, there were in 1880 55,175,000,000 feet of pine standing. Since that time 45,475,000,000 have been cut, so that in all the northern part of the United States there is now only two years' supply of white pine of the best quality left, with more or less pine of inferior quality.

The improvidence of the Government, and the insatiable desire to grow rich rapidly, have brought our neighbors' forests into this condition. It seems almost incomprehensible that a nation so intelligent and practical can allow itself to be despoiled of one of the principal sources of national wealth while it was so easy to render it perpetually productive.

And what have we done ourselves here in Canada? Have we not committed the same blunders? Has not our public domain been pillaged also? How many millions have been sent from Canada during the last fifty years to enrich the people of London? Our Pine-forests have nearly disappeared. The timber of which we were once so proud has vanished. The pine, which is now found only between the Red River at the west and Migen at the east, does not extend north of the forty-ninth degree of latitude in the valley of the Ottawa and the fifty-second degree in the region of Albany Lake. There is none north of Lake Superior. Our best Pine-forests were in the valleys of the Ottawa, of the San Maurice, of the Saginaw and their tributaries. All these have been destroyed, and now it is necessary to go 300 miles from Ottawa to the headwaters of the San Maurice and to Lake St. John to find lumbermen at work. All that immense forest-territory of the province of Quebec, of more than 100,000 square miles area, would represent to-day hundreds of millions if the state had managed it intelligently. But here, as in the United States, every one supposed our forests were inexhaustible. They have been cut without pity and without rest.

The Government was deaf to every appeal to protect the public forests as long as a few hundred thousand dollars, derived from the forest, was available to make up the deficit of the general administration. The sale of limits made often to political partisans, most often fraudulently and at prices absolutely ridiculous, have almost entirely ruined our forests. Great bodies of timber have been sacrificed at ridiculous prices in time of panic when there was no demand for timber. In 1844 the Government, among other limits, sold one of 100 square miles for \$4 a square mile—that is to say, at the rate of two acres for one cent. Is it possible to imagine any greater folly in the administration of Government affairs? The results of these wasteful methods are apparent. The cut of pine east of Montreal, which amounted two years ago to 250,000,000 feet, has now fallen to 25,000,000—that is to say, to an annual output of only ten per cent. of the former production—and this for the excellent reason that there is no more pine to cut in that region. It is the price of the ruin of the forest-capital of the province which the government of Quebec has received and still receives every year. We have obtained as a gift from our fathers a forest-domain unequaled in the world. It was able every year to produce an enormous revenue, sufficient, if properly administered, to meet all the expenses of the state. And we have not been sufficiently intelligent to administer this property in such a way as to perpetuate the revenue for

our children. On the contrary, without regard to the most elementary rules of forest-culture, we have alienated the forest-domain by throwing it open to a crowd of greedy speculators whose only other aim has been to destroy it entirely. Such criminal conduct merits the contempt and reproof of the whole world. The province of Quebec is not alone culpable. Ontario, New Brunswick, Newfoundland are even worse off than we are, and when the forest-resources of the Canadian confederation are examined, it is only too apparent that in a comparatively short time we shall be obliged to depend for our timber upon other provinces. British Columbia, on the Pacific side of the continent, is well wooded, but her forests are too remote to be of practical value to us here in the east. The timber supply of British Columbia will be needed by her own people and by those of the north-west. Her timber can be sent to Australia, California and South America more advantageously than to us here. From the Rocky Mountains to Lake Superior timber is scarce. It is disappearing rapidly in Ontario; and in the maritime provinces and in all the eastern counties consumption is increasing and the supply is disappearing very rapidly.

It is evident, then, that the province of Quebec must adopt at once the methods which are everywhere recognized as necessary to stop this destruction and assure by means of an intelligent administration the perpetuity of what remains of our forest-domain. It is necessary, in a word, to inaugurate here a system of regular cutting such as is practiced in France, Germany and other civilized countries, where not only the annual output is preserved, but the extent and value of the forests are steadily increased. The government of Quebec should, in order to preserve its forest-domain and increase for all time its productive capacity, adopt the following plan:

First. It should divide the public domain into five great forest-regions—namely, Ottawa, San Maurice, Saginaw, the counties of the east and the Gaspasie—and place each under the direction of a general forest-officer. Each of these forest-officers should then divide his region into as many forests as there are distinct regions, each composing a certain number of limits.

Each forest should be worked, under the direction of a forest-officer of the region, by a timber-merchant, owner of a saw-mill, and such a forest should be cut once in every twenty years or more, according to the nature of the soil and the trees which are found in it. In this way every year a twentieth part only of the forest would be worked; the remaining ninety-five per cent. will be left to its natural growth and protected against all inroads from the lumberman or his employees. By cutting each year trees only which have arrived at their full value, those preserved would be ready for the axe twenty years after. In this way a forest will perpetuate itself indefinitely, yielding constantly an equal and regular annual product without deterioration.

Second. Every year the Government should determine what will be the amount of timber called for by the needs of commerce in order to avoid the over-stocking of the market and the commercial disasters which result from over-production and the consequent shrinking in value of forest-products.

Third. As is well known, the squaring of timber in the woods, by which the soil is covered with chips, is an imminent cause of fire, and a third of the wood moreover is lost by this means. The Government should demand that all trees should be sawed, not hewn, or floated down the streams in convenient lengths to points of shipment.

Fourth. The Government should exercise an intelligent inspection over the operations of lumbermen, and it should be the duty of the general forest-guards of each region to mark themselves, or to have marked by their assistants, all trees to be cut or to be reserved in the annual cutting.

Fifth. The Government should send to the Forest-School at Nancy a certain number of young men who, having followed the course there in forest-studies, would be fitted later to assume the direction of our woods and forests.

Sixth. As the management of our woods and forests belongs to the department of the Minister of Agriculture, the general forest-guards should be placed under the direction of that officer in all matters relating to the valuation and exploitation of the forest-domain.

It will perhaps be argued that these indispensable forms will entail serious expenses on the Government. This is a mistake. It is simply a redistribution of duties and a transfer of the Government employees, which is necessary in order to put this system in operation.

And after all, a forest-domain of 50,000 square miles is well worth the trouble and expense of some attention. It produces

annually something like 400,000,000 feet of pine and 110,000,000 feet of spruce, besides 37,000,000 feet of red and white pine timber, 600,000 feet of hard wood, 4,500,000 railway ties, besides vast quantities of cedar, tamarack and 5,000,000 feet of fire-wood; the whole producing a revenue to the province of a million dollars. The total annual forest-product for all Canada amounts to \$25,000,000, and this will double certainly as wood becomes rarer in the United States. In a few years from now the province of Quebec will obtain from her forests a revenue sufficient nearly to meet all her expenses, provided an intelligent forest-administration can be established. We still have in our forests and in our waste land hundreds of millions of dollars with which can be assured the greatest prosperity of the province, but it is necessary that the men who govern us should realize the urgent necessity of administering wisely this magnificent inheritance upon which depends the future prosperity of the nation. And especially is it necessary that they consider the rights of the coming generation and determine to protect this inheritance against the attacks of the short-sighted and thoughtless.

Recent Publications.

North American Fauna. No. 3. Results of a Biological Survey of the San Francisco Mountain Region and Desert of the Little Colorado, Arizona. By C. Hart Merriam, M.D., United States Department of Agriculture, Division of Ornithology and Mammalogy. Washington, 1890.

This is the outcome of a careful biological study of the San Francisco-mountain region of Arizona, and although Dr. Merriam's studies are principally devoted to vertebrate animals, his paper contains much which is of direct interest to botanists, but interesting as it is, the results, as has been well pointed out in the *Botanical Gazette*, are specially "valuable in that they mark out a line of botanical work which the Government should at once enter upon and push to its completion."

Dr. Merriam deals with the general subject of geographical distribution, and the conclusions which he reaches are, that there are two life areas in North America, a boreal and a subtropical, both extending across the continent with long interpenetrating arms. He abandons therefore the three life areas generally accepted by naturalists—namely, an eastern, a central and western—establishing, however, in the particular region discussed seven lesser life zones, four of northern and three of southern or mixed origin. The correlation of the northern zones with corresponding zones in the north and east are pointed out.

Dr. Merriam first treats of the Alpine zone, which embraces the bleak and storm-beaten summit of San Francisco Mountain, which rises to an elevation of 11,500 feet. Nine of the species of plants growing here were collected by Greeley on the shores of Lady Franklin Bay, and many of them are found scattered over the mountain ranges in all the northern parts of the continent. It appears "that many of the plants found on the high rocky summits of San Francisco Mountain occur on the higher peaks of the Rocky Mountains, the Sierra Nevada and Cascade range, and the Appalachian chain. They occur along the arctic coasts of Alaska, Hudson Strait, north Labrador, Greenland, north Siberia and Spitzbergen; they occur in the Alps of Europe, in the Altai and Ural Mountains, the Pyrenees, and some of them even in the Himalayas. In brief, they inhabit the arctic regions of the globe and extend far south on the summits of the higher mountain ranges. Plants and animals having such a distribution are termed Arctic-Alpine Circumpolar species."

"Just below the barren arctic summit of the mountain is a narrow belt which may be named the Timber-line zone. Here the trees which reach timber-line (in this case *Picea Engelmanni* and *Pinus aristata*) lose the upright or arborescent habit and exist as stunted and prostrate trunks, whose gnarled and weather-beaten forms bear testimony to the severity of their struggle with the elements. In this narrow belt a number of hardy little plants attain their maximum development, decreasing rapidly in abundance both above and below. Many of them are circumpolar species found throughout the northern regions of America, and some of them throughout the northern regions of the world, coming south on high mountains, and occurring in greatest perfection just at or near the edge of the northern limit of trees, and at timber-line on mountains further south. Such plants are known to botanists as 'sub-Alpine' species, and it would be well if the term sub-Alpine were restricted to the characteristic species of this zone."

"Passing down into the next zone, the Spruce-zone, a num-

ber of plants, birds and mammals are encountered which are characteristic of humid northern regions, but regions not quite so cold as those inhabited by the species which occur on the snowy summit and at timber-line. The characteristic trees of this zone are Engelmann's Spruce (*Picea Engelmanni*) and the Fox-tail Pine (*Pinus aristata*). The fact of present interest is that many of the plants here enumerated as growing in the Spruce-zone of this mountain are equally characteristic of the upper Spruce-belt of the higher Alleghanies, the Rocky Mountains, the Cascades and the Sierra Nevada, and occur also in the great northern Spruce-forest of Canada. It is well known that the northernmost part of our continent consists of bare rock and frozen tundras. There are no trees along the sea edge of Labrador or Hudson Strait, or along the coast region of arctic America from Boothia Felix to Alaska, but just south of this region a large forest begins which has been called the Great Pine Forest. There is not a Pine-tree in it, but it is called Pine because conifers in general are called Pines by people who are not botanists. The tree that grows there is a species of Spruce congeneric with the Spruce which occurs high up on San Francisco Mountain, and many of the humbler plants are either identical or closely related representative forms."

"The distinctive tree," of what Dr. Merriam calls the Canadian or Balsam Fir-zone, "is the Douglas Fir (*Pseudotsuga taxifolia*), which ranges northward to British Columbia. Another tree of nearly coincident vertical distribution on the mountain is the lofty Rocky Mountain Pine (*Pinus flexilis macrocarpa*), which extends north to the Kootenai region and Calgary, in Canada. Wherever the Douglas Fir has been burned off its place is taken by the Aspen (*Populus tremuloides*), a species of wide distribution in the north, where it ranges from New England to Newfoundland and Labrador, and thence westward to Alaska, reaching its highest perfection along the southern part of the great coniferous forest of northern Canada, and coming south in the mountains." In this belt Dr. Merriam found such plants as *Geum triflorum*, *Potentilla fruticosa*, *Actæa spicata* and *Viola Canadensis*, all of wide distribution in our north-eastern flora, as well as a *Ceanothus* representing a western-American genus, with two species penetrating into our eastern flora.

The next natural division is called by Dr. Merriam the Neutral or Pine-zone. "The characteristic and only tree of the Pine-zone is *Pinus ponderosa*, which forms an unbroken forest over the whole of the lava plateau above the altitude of 7,000 feet, and extends up as high in some of the parks as 8,800 feet. As a distinctive species, however, it loses its character at about 8,200 feet, where it is invaded and soon after replaced by *Pinus flexilis*, *Pseudotsuga taxifolia* and *Populus tremuloides*. *Pinus ponderosa* may be regarded as a tree of the middle elevations, occurring between the Piñon and Cedar of the lower hills and the Firs and Spruces of the higher mountains. In such situations it ranges from the highlands of western Texas and northern Mexico, northward along the Rocky Mountains and Sierra Nevada to the dry interior of British Columbia, in latitude fifty-one degrees thirty minutes, avoiding the region of excessive rainfall along the coast from northern California northward."

Next below is the Piñon-zone:

"The distinctive trees of this zone (6,000-7,000 feet) are the Piñon or Nut Pine (*Pinus edulis*) and the so-called 'Cedar' (*Juniperus occidentalis monosperma*), both averaging about sixteen feet in height. The singular checker-bark Juniper (*Juniperus pachyphloea*), a very handsome and conspicuous species, occurs in two or three special localities, but is rare. Several large shrubs not observed elsewhere are abundant in parts of this belt, namely, *Berberis Fremontii*, *Rhus aromatica*, var. *trilobata*, and *Spiræa discolor*, var. *dumosa*. Both the Piñon and Cedar occupy elevations of corresponding temperature in the arid lands from western Texas through New Mexico and Arizona and northward to central Colorado, and the Cedar reaches westward to southern California. Closely related and strictly representative forms extend northward through the Great Basin to the Plains of the Columbia. The other species mentioned occupy more or less of the same range, and some of them push northward over the Great Plains as well as the interior basin."

Space will not permit us to reproduce Dr. Merriam's account of the desert of the Little Colorado, the so-called "Painted Desert" of the earlier explorers, which he crossed and recrossed several times. The extracts we have laid before our readers are sufficient, however, to call attention to the importance and interest of this publication, which is by far the most considerable contribution to our knowledge of the plants and animals of a peculiarly interesting region which has yet appeared.

Notes.

The Massachusetts Horticultural Society will offer \$3,800 next year in prizes for flowers and plants.

Fifty-six Chrysanthemum shows in as many towns and cities have been reported so far this year in the *American Florist*.

The death is announced of the German landscape-gardener, Niepraschk, the author of many important parks and gardens in different parts of Germany, and in recent years Director of the Garden of Flora at Cologne.

Not less than \$1,600 was taken from the sale of tickets to the Chrysanthemum exhibition recently held in Boston by the Massachusetts Horticultural Society. Financially this was one of the most successful exhibitions ever given by this Society, the receipts being double those of last year at the corresponding exhibition.

Pierre Tschihatheff, the distinguished traveler and naturalist, has recently died in Florence. He is known by his French translation of Grisebach's "Vegetation der Erde," which he enriched with many original notes, and by his great work on the natural history of Asia Minor. It was for him that the Pyrethrum, now used successfully in dry countries to form turf in the place of grass, was named.

Our figures of the *Aristolochia* this week will recall the interest which was excited by the flowering in Kew last spring of *Aristolochia Goldieana*. The plant was described as so small that it could be crumpled in a man's hand, while the great white-tubed flower was too large to conceal in a peck measure. The interior of the flower was strangely beautiful, too, with its pencilings of purplish chocolate on a ground of old gold. *Aristolochia longicauda*, mentioned last week, is one of the most distinct and handsome of the unilabiate group.

Tuberous Begonias, Herbaceous Pæonies and Chrysanthemums are to be added next year to the list of flowers for which the so-called prospective prizes are established by the Massachusetts Horticultural Society. These prizes are offered for the best seedling raised by the exhibitor and shown for three years consecutively. Many seedling plants, notably Chrysanthemums, produce good flowers at their first blooming, and then deteriorate, and eventually prove worthless. Under the plan adopted by this Society the raisers only of well tried varieties are rewarded.

There were 136 seedling Chrysanthemums shown at the Philadelphia exhibition, and, according to John Thorpe, who acted as one of the judges, one out of every five had genuine and distinct merit. It may be added that Mr. Thorpe speaks with disrespect of that "scale of points" which had been devised to secure an accurate estimation of the quality of Chrysanthemums. He says that the judges made only one mistake, and that was in a case where they attempted to cipher out the value of a Chrysanthemum by a sum in arithmetic. After that the "scale of points" was discarded.

A correspondent of the *American Architect and Building News*, while confessing that no definite solution of the building problems involved in the "World's Fair" at Chicago has yet been arrived at, says that, "according to the best authorities, the Committee now expects to report with suggestions for buildings substantially as follows," as regards those in which our readers are most interested: "Agriculture, 1,200 feet long by 400 feet wide, with annex for power-house"; and "Viticulture, Horticulture and Floriculture, to be built in the form of a cross, each of the four wings being 200 by 150 feet, and the central rotunda 200 feet in diameter. An annex for heating boilers is also suggested for this building."

The *Popular Science Monthly*, quoting from a lecture on museums by Dr. G. Brown Goode, says that the earliest general collection shown to an American public was formed by a man named Arnold, at Norwalk, Connecticut, prior to the Revolution, and consisted of birds and insects. It first awakened an interest in scientific matters in President John Adams, who visited it several times "as he traveled from Boston to Philadelphia, and his interest culminated in the foundation of the American Academy of Arts and Sciences." But, it is added, the history of American scientific museums had its true beginning with the establishment of the Academy of Natural Sciences in Philadelphia in 1812 and the New York Lyceum of Natural History.

The *Builder* recently described a little church at Greensted, in Essex, England, which, although built of wood, has stood

for a thousand years, and is still in constant use. Its chancel is of brick, and seems to have been added in the sixteenth century; but the nave, which is thought to have originally been the whole of the building, and to date from the latter part of the ninth century, has only a plinth of brick, upon which rests a sill supporting the walls, which are formed of planks so thick as to be almost logs, about four and a half feet long and two or three feet wide. These walls are windowless, light entering only through dormers in the roof, which is of shingles and is not more than forty years old.

Mr. Maries, the well known collector, gives in the *London Garden* the following account of how *Primula obconica* was introduced: "When I was traveling in central China I was much puzzled how to bring out living plants 1,100 miles to the coast at Shanghai. I, of course, took plants of the things I thought were the best for garden purposes, but Ferns and herbaceous plants were altogether out of the question. I thought, however, that many seeds would germinate if they were kept in soil, so I collected surface soil from about Ferns and Primulas and other plants. This was kept in an old wine box, and eventually taken to Hong-Kong. I took this home twelve months afterward, and the soil was 'sown' in a glass house. The first thing that came up was *Primula obconica* in large quantities, several shrubs and a lot of Ferns. I have often seen remarks in *The Garden* about the native habitat of *Primula Sinensis*. This grows wild in all the gorges leading to the Yang-tse River above Ichang. Where I stayed, there in a cave temple, a few miles above Ichang, the clefts in the rocks above and below the cave entrance were full of *P. Sinensis* in immense tufts in full flower. This was in February."

Some systematic experimental work has been carried on at the Botanic Gardens of Georgetown, Demerara, since the seminal fertility of Sugar-cane has been proved. It has been established that propagation by seed in ordinary field cultivation will never be adopted, because in a great majority of varieties two years are required from the time the seed is sown before the seedlings mature, or fifteen to eighteen months are needed from the time they are strong enough to be planted out in the open ground. Besides this, the delicacy and slow growth of the cane in its infancy is an insuperable obstacle. The practical use that can be made of seedling cane is in obtaining new varieties. These seedlings vary very widely, and they have a marked tendency to improvement. In many cases the advance in quality and size of the cane has been remarkable. It is hoped by the Director of the Botanic Garden that the canes may be increased in size and weight and that the sugar content may be increased also. It is not improbable that in addition to these essential qualities the cane may be improved in habit of growth, resistance to drought, degree of earliness, percentage of fibre, etc., so that it is not impossible that a marked advance in sugar culture will be made from these seedlings.

The variety of uses to which the bark of the Cork Oak is put in southern Europe, as indicated in a report of United States Consul F. H. Schenck, will surprise most American readers. "Although," he says, "what gives most value to cork are the bottle corks, still it has other applications, some of considerable importance, such as plates or slabs for use on boilers, room carpets, the making of rugs, life-preservers, cork-dust bricks, hats, album-covers, picture-frames, jewel-boxes, bracelets and other objects of adornment; soles for shoes and boots, wheels of small dimensions for railroad cars, and the grease-boxes of the wagons; and recently it is applied as 'Corcho laminado,' or ornamental slabs, the invention of Don Buena-ventura Reull, of Barcelona, which is employed to cover plane surfaces and curves, employing them as carpets and for other uses. They make, moreover, huts for those who work at cork, and in Turkey they make cork coffins. In Italy they make images and crosses, shoes, horse-saddles, horse-shoes, arms, blacking, fortifications, furniture, soles for shoes, wadding for mortars, and obtain lampblack for printing in the United States, and the round or hollow cork is especially employed in the province of Valencia to husk rice. It is also used for bee-hives, pans and pails to deposit or carry milk; in ornaments in gardens, for relief maps to form the elevations, for floats in fishing apparatus, for pails where they cool water with ice or snow, etc. From the imperfect combustion of cork is obtained Spanish black, a product much esteemed for making printers' ink." To this we may add that artists in Italy and Spain carve pictures in relief in cork which have much the appearance of being moulded of terra-cotta; and that the packers of fruit for export now seem to prefer a coarsely granulated cork to the traditional sawdust packing.

It is not our purpose to criticise the conclusions reached by Mr. Greene. He has had better opportunities than any of his predecessors to observe these plants growing over wide ranges of country, and therefore under dissimilar conditions with regard to soil, climate and exposure, and whether his ideas of the specific rank of some of the western Oaks are generally accepted or not, the value of his investigation cannot be denied. A complete knowledge of these trees, or even an approximately complete knowledge of them, such as exists with regard to our eastern Oaks, the result of two centuries of investigation, will only be reached by the study of the trees in the field by a large

number of students approaching the subject from different points of view. The accumulated knowledge thus gained will give the best idea that can be obtained of this group of trees and of the limitation of the species. Botanists, however, will always differ in their conception of species, and in the case of the California Oaks the varieties of one will be species for another, or what one author considers a species another will regard as only a variety or as a natural hybrid. Information of this character, unsatisfactory, doubtless, as it may appear to those persons who believe that it is the duty of the naturalist to find unalterable characters for every species, will only be reached through field observations, and the more people who study our trees in the field, as Professor Greene is studying them in California, the more accurate and satisfactory will be our knowledge of them.

These two papers upon our western Oaks must be ranked among the important contributions which have been made toward an understanding of North American trees.*

RATHER more than a year ago we gave some account of the forest of the city of Lynn, an area of wooded land once held in common by the proprietors of the city for the fuel and timber they needed, and now restored to the use of the public. It is altogether the largest area which has been dedicated to park purposes in New England. The territory remains in nearly its original state, being a region of rocky hills with bold ledges and deep glens, through which rapid brooks find their way. From an article in the *Boston Herald* it appears that the commissioners who have been charged with the administration of this work have acted with wisdom, making several miles of substantial roads and laying convenient footpaths to the places of the greatest interest. The most important change has been in the completion of a new water-basin known as Glen Lewis and Walden Ponds. A substantial stone dam divides the basin into two sections, the upper level of which goes by the former name and the lower by the latter. The two form a long body of water of varying width, with branches extending between the hills, whose slopes are covered with healthy young Oaks and masses of White Pine and Hemlock. Looking up and down the valley from certain points this basin has the effect of a large river, and glimpses of it obtained from the neighboring hills are remarkably beautiful, while from some of the more elevated points prospects of great extent and varied interest stretch away on every hand. Of course it will be the aim of the management to preserve as far as possible the original features and natural charm of the whole region. It can be maintained more cheaply on these lines, and it will be much more satisfactory than if an attempt were made to subdue its wildness into pastoral or park-like scenery or to transform it into something artificial and formal. Some portions of it are to be held as a productive forest, and the success of this experiment will be watched with attention.

The important fact, however, is that the city of Lynn has led the way in establishing a public forest, and has thus set an example for other cities which have similar opportunities. It is true that there are few such regions of wild forest-land adjacent to bustling cities; but in several towns of the middle and New England states there are wooded gorges through which happy brooks are flowing, and tracts of broken land, and wherever these natural features exist it would seem the part of wisdom to take possession of them before they are obliterated by "improvements" of some sort. Some of the new cities which are growing so rapidly in the south will soon be lamenting over lost opportunities after the neighboring forests have quite disappeared. In the north-west, too, young cities are growing into an exact resemblance of older towns in the east without a thought of preserving the primeval forest which they are displacing, and yet a thousand acres of

Douglas Fir and Giant Thuya would make a forest-park so characteristic and so noble that, fifty years hence, it would command the admiration of the world.

The California White Oak.

THE largest of the California Oaks, one of the largest of the genus and the most graceful of all the species which inhabit North America, is the White Oak of the California valleys (*Quercus lobata*), of which a portrait appears on page 611.

The California White Oak attains sometimes a height of one hundred feet, with an enormous trunk seven or eight feet through, separating often near the ground into several main branches, whose ultimate divisions are long, slender and pendulous, the whole forming a broad head of surprising grace and beauty. The aspect of the tree seen from a little distance is rather that of the best type of the New England Elm than of an Oak, and more than any other tree this White Oak gave the peculiar park-like appearance to the valleys of central California, which so delighted travelers before these valleys were turned into Wheat fields.

The great size and the graceful habit of *Quercus lobata* are not the only beauties of this tree. The leaves which clothe the slender branches are large, bright colored and deeply lobed. The acorns, which are quite unlike those of any of our eastern Oaks, are slender, usually pointed, and sometimes two and a half inches long, with hemispherical tuberculated cups.

The wood of this tree is brittle, like that of all the California Oaks, and is practically worthless except for fuel. Economists deplore the poor quality of the timber produced by the California Oaks. There is, however, another side to this question, and California is, on the whole, a gainer in several thousand noble trees, which, had they produced timber as valuable as that of eastern White Oaks, would long ago have been converted into wine casks, and the California valleys would have lost forever their greatest charm.

We are not aware whether the attempt has ever been made in California to cultivate *Quercus lobata* as an ornamental tree. Outside of the state none of the California Oaks have ever succeeded in any marked degree, although various attempts have been made in different parts of Europe to grow them. They need, probably, the long, hot, dry summers which European climates do not afford. They might, however, be expected to succeed in Australia or in northern Africa, and should this prove true there could be no more splendid tree for the ornamental plantations of these countries than this Oak.

Our illustration is made from a photograph, communicated to us by Mr. William Alvord, of San Francisco, of a very fine specimen growing on General John Bidwell's farm in Butte County, one of the wonders of California's agricultural prosperity. This particular tree is remarkable for its great spread of branches, which have a diameter of nearly one hundred and fifty feet, rather than for the size of the trunk, which is only six and a half feet in diameter. The tree is growing on sandy, alluvial soil, and is honored with the name of "Sir Joseph Hooker," who visited and admired it in 1877 in company with Asa Gray.*

The Autumn Flora of the Lake Michigan Pine Barrens.—II.

THE most attractive flowers at this season, however, are the Blue Gentians, seen by thousands throughout the moist grounds of the barrens. Two species of them are recognized in our descriptive botanies, *Gentiana crinita* and *G. serrata*, but they run into each other so imperceptibly and completely that it matters little to which of the two many of the plants are assigned. Those whose leaves are broad and short are apt to have a more deeply fringed corolla, with some other distinctive marks, while those with narrow or linear leaves have the fringe of the corolla short or obsolete. Such will confidently be referred to the types of the respective species, but many that come between will be accepted with hesitation. The floral colors vary from pale to bright blue, the darker shades preponderating particularly with the narrow-leaved plants. When they grow in company with *Solidago Ohioensis* they either share the ground with it or more often form a kind of border to the yellow patches, apparently not succeeding in quite as moist localities as this Golden-rod may select. In similar places, but much less common, *G. Saponaria* and *G.*

* "Illustrations of West American Oaks," from Drawings by the late Albert Kellogg, M.D., the text by Edward L. Greene. Published from funds provided by James M. McDonald, Esq. Part I. San Francisco, 1889.—Part II. 1890.

*A portrait of this tree, made, perhaps, from the same negative, although greatly reduced, was published by Dr. C. C. Parry in an article descriptive of Rancho Chico, which first appeared in the *Overland Monthly* for June, 1888, and was afterward issued separately.

Andrewsii may be found, their corollas bright blue and scarcely opening. Very rarely *G. alba* will be seen, its flowers yellowish white. The last begins to bloom in midsummer and continues till the middle of September, being considerably earlier than any other Gentian here. On the higher ground *G. puberula* is not uncommon, its corolla very dark blue. It is a low plant, not often more than ten or twelve inches high, but succeeding admirably in the sand, and striking its long roots, generally two in number when they start from the base of the stem, deep down into the ground to the distance of two feet or more.

Vying with the *Solidagos* in contributing yellow flowers the present season (1890) was the shrubby *Potentilla* (*P. fruticosa*). They were as fully in blossom as in the earlier part of the summer. Though they continue in flower a part of September, their profusion this year was somewhat exceptional, and is doubtless due to a prolonged drought followed by rain the latter part of August, which has stimulated some plants into new activity and made these a conspicuous feature of the flora. Long strips of yellow bordered the wetter ground beside the sloughs, which run quite straight and parallel, sometimes for several miles. They usually grow in situations too wet for Golden-rods; but some that root in mossy bogs, like *S. neglecta* and *S. uliginosa*, are present to increase the effect, lifting above the shrubs their dense panicles of yellow.

A pretty plant of low stature, but looking frankly up at the beholder like a broad, white eye, is our only *Parnassia* (*P. Caroliniana*). It is very smooth, with a few wide or roundish leaves near the ground, and a smaller sessile leaf midway up its simple, scape-like stem, which bears a single flower at its top. This is peculiar, and always a subject of interest by reason of its crown of abortive filaments mixed with those which are anther-bearing. They are seen abundantly in the damp soil where the grass is not too rank, and often in such close proximity as to nearly cover the ground with white.

Two Orchidaceous plants still linger beyond others of their family, one in its proper season (*Spiranthes ceruna*), the other (*S. gracilis*) past its best. The former grows on bogs or in wet, grassy land, often hidden away beneath the small shrubs. No bouquet of wild flowers gathered where it is found would be deemed complete without a liberal supply of its chaste white flowers to give to the whole a delicious perfume. On account of its odor it has doubtless obtained a common name, especially among children, as the "Wild Tuberose." *S. gracilis* is seen in drier ground amid the overshadowing Pines. In similar localities, with these and with *Parnassia*, may still be found fair specimens of *Sabbatia angularis*. It has also passed its prime, but is common during the early part of September. It bears an ample number of flowers of a deep rose color, with a greenish star, bordered by a dark red or purple line, at the base of the spreading corolla, making them an unfailing source of attraction in its native wilds as one of our handsomest flowers.

Two species of *Coreopsis* are now in full bloom, *C. trichosperma* and *C. tripteris*, one or the other found nearly everywhere along the margins of the ponds or in very wet ground, the former the more common. When from six to twelve inches high it bears a flower barely more than half an inch across; but when it reaches a height of four or five feet it branches widely, and is well supplied with large heads that measure two inches from end to end of rays. With us it is a smooth plant, with a stoutish stem furnished with few leaves divided into narrow, almost thread-like segments. With its many flowers having golden yellow rays and a yellow disc, it takes a prominent place in the autumnal flora. *C. tripteris* has a greener stem and leaves of a different pattern. They are quite uniformly divided into three lanceolate segments, and are rather widely spaced on the tall, smooth stems. Its rays are not of so deep a yellow as in the case of *C. trichosperma*, but contrast sharply with the flowers of the disc, dark brown or almost black when they reach maturity, giving to the blossoms a different look.

Where the *Coreopsis* grows, and in localities not quite so wet, our prettiest *Gerardia* (*G. purpurea*) is found. Its average height is about a foot, and the open, nearly bell-shaped, rose-purple flowers are large for a small plant, being almost an inch in length, and often nearly as broad as long. The whole plant, though widely branching, is very slender, so that it looks as if its flowers would weigh it down, several of them appearing at the same time. It is exceedingly abundant and occurs throughout the region. The smaller flowered *G. tenuifolia* grows in like situations, but is not so common. Still another small flowered species is not out of bloom in the early fall, but much less common, or even rare. This is *G. Skinneriana*, the smallest of the species here. It has a few short and

thread-like leaves, which are far apart on a slender and mostly simple stem hardly a foot high. It likes the moist ground, but also takes to drier places than the other two. Both of these have paler flowers than those of *G. purpurea*, and are very pretty species. In the dry ground may be gathered the large, yellow flowers of *G. pedicularia*. Its foliage is handsome, the leaves being much cut up, and, together with the branching stem and flowers, are thickly covered with a viscid pubescence. The whole plant, except the flowers, frequently takes a purple hue. Were it not for the parasitic habit of the roots of *Gerardia*, making them difficult to cultivate, they should become most welcome flowers for the garden.

Four kinds of *Utricularia* may be met with in September. *U. cornuta* is abundant in the wet sand, often rendering the ground yellow with its numerous flowers. The stems are short, from four to ten inches high, each bearing three or four large yellow flowers. They grow in great numbers among the scattered Rushes or in spots bare of other plants in open, sunny places. They delight most in situations where the water has dried away, in the wet sand or mud, and would make a pretty border for the sandy margin of an artificial lake. The minute *U. gibba* is occasionally seen in the shallow water by the edges of the sloughs, its scape bearing one or two small yellow flowers. Still rarer is *U. resupinata*, its one small purple flower seeming to rest crosswise on the end of a scape two to six inches high. It affects about the same condition of growth as *U. cornuta*. *U. purpurea* is a purple flowered species also, but it floats on the surface of the ponds. The stems are long and branching, and covered with little bladders which serve to float it on the water. From these stems a few two or three flowered scapes rise above the water, with blossoms nearly as large as those of *U. cornuta*.

In many places in the driest sands *Monarda punctata* abounds, seemingly regardless of all conditions of moisture as dependent on the weather. Its large yellowish or purplish bracts are its most prominent feature, but, hidden among them or peeping out from their midst, are some dainty flowers—yellow, dotted with purple spots.

Artemisia Canadensis flourishes everywhere in the dry sand. Its flowers are inconspicuous if considered separately, but are very numerous on the wand-like stem and branches. But its finely dissected leaves and strict branching stem thickly covered with them make it, on the whole, a comely plant. It is sometimes hoary with a gray pubescence, but not so much so as some other species, being generally of a lively green, keeping its color well against the frosts when most of the other plants are dead.

Englewood, Chicago.

E. J. Hill.

Private Grounds and Enclosures in Cities and Towns.—II.

THE requirements of city dwellings in the way of out-door space, such as might be afforded by giving enlightened attention to the subject, are quite different from those of the suburbs. It is probable that the model city of the future will have an open, garden-like character radically in contrast with the closely built cities of to-day, and there are already indications that our cities will gradually be rebuilt in conformity with that idea. Every one who visits certain portions of Spain, or of Spanish America, is charmed with the feature known as the "Patio," the interior court of a dwelling-house, surrounded with arched corridors, a plashing fountain in the centre, perhaps planted with Orange-trees and Oleanders, and with the corridors bordered by rows of brilliant flowering plants in graceful pots or vases, while the air is musical with the song of numerous birds in their cages. This, like the "close," is an out-door apartment.

In most of our northern cities the climatic conditions are such that this inner court feature is impracticable. Yet a modification of it is something that should become a feature as characteristic as the patio is to the houses of Mexico or Andalusia. That is, instead of having the interior court a feature of a single house, let it be common to a neighborhood of houses. Let the space now devoted to unsightly back-yards and alley-ways in the quadrangle formed by the four streets of the usual city block be converted into an enclosed garden space, where children may romp in safety, free from the influences and dangers of the street, and where the open air may be enjoyed in common by all the surrounding households. It is possible to make a delightful garden of such a place.

Successful efforts have already been made in this direction. In one of the new districts of Boston a few years ago, in the building of blocks of houses on the four streets forming a

quadrangle, a turfed enclosure and playground was laid out in the centre, and it has proved a very satisfactory and attractive feature. This idea lends itself admirably to the construction of apartment houses in a neighborhood. The chief hindrance to its general adoption lies in the indisposition of builders toward acting co-operatively, even where their common advantage is concerned. But as the benefits of the plan become evident this obstacle will probably be overcome, and we may look to see at no distant future the new additions to our cities and the newly planned cities of this country so arranged that their dwellings shall enclose common pleasure-grounds for each block ample in space and beautiful in design. The maintenance of these in attractive shape would be as much a matter of pride with the residents as the proper care of their grounds is with the residents of an enlightened suburban or rural neighborhood.

The desirability of this plan in its application to a neighborhood of working-people is illustrated in an interesting experiment just tried by the city of Liverpool in the erection of houses for that purpose. An unsightly tract, covered with wretched hovels, was condemned by the city under the act of Parliament authorizing municipalities to take such action, turning out 1,300 people. Under special plans by Mr. Clement Dunscombe, who was afterward awarded a gold medal at the International Health Exhibition for this work, a quadrangle of pleasant five-story buildings was established with room for 600 or 700 people. The open space is devoted to a playground and garden, with five arched passage-ways from the streets. The garden is adorned with a fountain, and there are walks and roads of gravel. Should this plan be generally adopted by cities there would be no necessity of incurring large expenditures for demolishing buildings in tenement neighborhoods to create small parks; the needed breathing places would be supplied by these enclosures, and the whole work would be a profitable transaction for the city, for the Liverpool enterprise yields the municipal treasury a return of four per cent. on the investment, with the rates for rents placed at a remarkably low figure.

Another enterprise in Boston, or rather in the adjacent town of Brookline, is worthy of mention as indicating the tendency to an open character in city construction. Out on the beautiful new Beacon Street improvement, near Chestnut Hill, where the suburban neighborhood is rapidly assuming an urban character, expensive blocks of houses have been built on the "terrace" plan, after an artistic design. These houses not only have small individual gardens, but they face a large and handsome garden, the use of which is free to the tenants or purchasers for tennis, croquet and general recreation. The residents in these houses are also furnished daily, at reduced rates, with fresh vegetables and pure milk from a farm belonging to their builder.

Eventually our cities can perhaps be rid entirely of the drawbacks of their closely built character, which, with the attendant confusion, noise and confinement, is responsible for much of the disease and discomfort of urban populations. They will then be transformed into expanses of house-enclosed garden-spaces, which, with the establishment of large and numerous public parks, will combine upon the same area the main advantages of both city and country life.

Boston.

Sylvester Baxter.

Plant Notes.

Vanda Batemanni and Vanda Lindeni in Their Native Country.

THE thirty-five or forty species of the splendid genus *Vanda* are widely scattered in tropical Asia from the Malay Archipelago to the base of the Himalaya Mountains, where only *Dendrobiums* and some of the genera peculiar to a more temperate climate occur. These favored regions of southern Asia are especially noteworthy on account of the abundance and splendor of the Orchids which they contain.

The numerous groups of islands which compose the Malay Archipelago offer a vast field to botanical explorers. Unfortunately, many of the islands are surrounded by coral reefs which make landing difficult. At the time I visited this Archipelago I tried to navigate as near as possible to the coral reefs, endeavoring to explore the flora of each island with the aid of my field-glass, especially when the island was so small as to make the landing undesirable, the landing on these islands, as I have said, being always exceedingly difficult.

It was in this way that I first saw *Vanda Batemanni*, growing almost at the sea-level, when the tide was in, upon rocks rising from the water. In the little island where I found this

plant for the first time it existed in great quantities and in handsome straight specimens. The best were those which grew against shrubs or on isolated rocks. I saw several which were more than six feet high bearing on each side of their stems from four to eight floral spikes. I noticed many other Orchids on this island. The plants, with one exception, however, were not in flower, and I could not determine the genus at the time. The exception, however, made a great impression on me. It proved to be *Bulbophyllum grandiflorum*. The plant covered entirely a little tree with its flowers, producing at a little distance a most remarkable effect.

Vanda Lindeni, which I discovered in one of the islands of this region, grows in an entirely different way. It is found almost always on the dead branches of large trees, on the borders of small forests, or on fallen trees near the banks of rivers or brooks, but always at a certain distance from the ground. This remarkable species appears in clusters, with from fifty to two hundred stems, and sometimes with even more. It is a difficult matter to collect the plants, as the red ants, one of the scourges of that beautiful country, always make use of them to establish their nests in. The natives are very much afraid of their bite, which produces an eruption which lasts for several days. They are, therefore, exceedingly unwilling to climb the trees where the plants are growing for the purpose of collecting them. So I was obliged to employ another method for gathering the plants. I fastened several bamboos end to end and fixed a hook at the end of the long pole thus obtained. In this way I was able to pull down a few small clusters. As soon as the plants fell we dragged them at once to the water and gave them a good bath in order to rid them of the terrible guests with which they were often covered.

Vanda Lindeni is extremely prolific. I have seen clusters of stems upon which there were more than a thousand flower-spikes, most of them with from twenty to twenty-five flowers. Unfortunately, the specimens of this marvelous Orchid which I was able to bring living to Europe only give a very incomplete idea of what this plant is in its native home, both as to the size of the specimens and the abundance of the flowers.—Auguste Linden in *Le Journal des Orchidées*.

New or Little Known Plants.

Streptocarpus Dunnii.*

THIS is one of the most remarkable of the many remarkable plants of Africa. It was introduced to Kew in 1884 by means of seeds sent from the Transvaal, on the mountains of which, near a place called Spitzkop, it is said to be abundant. The seeds soon germinated, and the development of the plants was watched with increasing interest as the solitary leaf, of which each consisted, gradually assumed extraordinary proportions. Its ultimate size was over three feet in length by sixteen inches in breadth, the petiole as thick as, and no longer than, a man's thumb, whilst the blade extended along the ground like a large Rhubarb leaf. The principal nerves were very thick and fleshy, and the under side was thickly clothed with a reddish tomentum, the upper surface being also hairy, and gray-green in color. The effect produced by about a hundred plants of this *Streptocarpus*, which formed a border round a large bed of succulent plants in one of the large houses at Kew, was particularly striking. When, however, the plants flowered, their interest and attractions were considerably increased. From the base of each leaf, and extending some few inches up the midrib, there was a row of scapes packed close together and rising erect to the height of a foot or more, branched, and bearing a perfect sheaf of flowers (see Fig. 81, p. 609). One of the strongest of the plants had over one hundred flowers expanded at the same time. Before the flowering season was over each scape produced about sixty flowers, each of which was one and a half inches long, tubular, slightly curved, lobed, puberulous and colored a bright terra-cotta red. The plants commenced to flower in May and continued till August, when they ripened abundance of seeds.

A dry atmosphere, absence of shade, with a moderate amount of moisture at the root, and a well drained loamy

*Hooker in *Bot. Mag.*, t. 6903.

soil, were the conditions under which this plant grew so well at Kew. In pots the leaves are apt to get damaged, or to turn yellow toward the apex. Every year since its introduction this *Streptocarpus* has been a prominent feature in the Succulent House at Kew. So far as experience here has gone it is not worth while trying to save the plants after they have flowered. By sowing seeds every year a succession of young plants is easily maintained.

probably the finest *Streptocarpus* we have, is that called *S. Watsoni*. It has several large green leaves about twice the size of *S. Rexii*, and many flowered scapes of Pentstemon-like flowers, which are colored a rich rosy crimson with darker mottled lines in the throat. This hybrid has so far proved sterile with its own pollen, although it produces seeds when the pollen of some other kind is used. It can only be perpetuated by means of leaf-cuttings or by



Fig. 81.—*Streptocarpus Dunnii*, half natural size.—See page 608.

By crossing *S. Dunnii* with several other species some interesting and pretty-flowered hybrids have been obtained at Kew. The first were named *S. Kewensis* (from *S. Dunnii* and *S. Rexii*) and *S. Watsoni* (from *S. Dunnii* and *S. lutea*). These were figured and described in the *Gardeners' Chronicle* in 1887. Other crosses from these and *S. Saundersii* have since been raised, while by crossing the hybrids with each other and their parents a large number of forms, showing considerable range of variety in color and habit, have been the result. The showiest of all, and

crossing its parents. By this latter method a good supply of seeds may easily be had, and the plants from them show scarcely any difference from that first flowered, except, perhaps, slightly in the shade of color. Many of the latest crosses which have flowered this year at Kew are of considerable promise. By crossing and selecting from the best of these plants it is probable that in a few years we shall obtain a race of *Streptocarpi* which, in a greenhouse, will fill as large a place as the *Gloxinia* now does in the stove.

Kew.

W.

Foreign Correspondence.

London Letter.

GAMBIER.—This is an article of considerable value to the tanner, the dyer and the druggist. It is obtained from the leaves of a Rubiaceae shrub known as *Uncaria Gambier*, and is an ally of the Negro Peach (*Sarcocephalus*) and the Cinchona. Hitherto its cultivation and preparation have been a monopoly of the Straits Settlements; but owing to the fact that it has become difficult to procure, and, when procured, so often proves almost worthless through bad preparation and adulteration, its extended cultivation has for some time occupied the attention of the authorities at Kew. Seeds of the plant were therefore obtained from Singapore and a batch of plants raised from them at Kew. These have lately been dispatched, under the personal care of Mr. Morris, to some of the English colonies in the West Indies, where it is anticipated they will thrive and prove to be the starting point of a valuable industry. In the *Kew Bulletin* for October, 1889, attention was directed to the value of Gambier as "an article which every tanner in the kingdom uses more or less, and no other can take its place. It used to cost £10 per ton and now costs £45."

Gambier is obtained by boiling the leaves of the *Uncaria*. It is imported in the form of small squares or little round cakes. The finer samples are used in India for chewing along with betel leaf and medicinally. The plants grow rapidly and yield several crops of leaves every year for from fifteen to thirty years from the time of planting in the fields. They require a moist tropical climate, such as is favorable to the cultivation of the Cocoa-plant, Vanilla, Ginger, etc. The Gambier industry is at present chiefly in the hands of Chinamen, but their system is said to be wasteful and the preparation of the article unsatisfactory. With improved methods of cultivation and preparation the value of Gambier may be considerably enhanced. Its introduction into the West Indies will probably prove as important an event almost as the introduction of the Cinchona from Peru into India. In addition to its value to the tanner and the dyer, Gambier is known to possess useful medicinal properties; it is also used in beer-brewing. I call attention to this plant and its introduction into the West Indies because I observe that the United States Consul at Singapore has reported that "the exports of Gambier to the United States during the last three years have amounted to \$1,060,000."

LILY-FLOWERS AS FOOD.—It is well known that the dried flowers of certain species of *Lilium* form an important article of food with the Chinese and Japanese. Examples of the Lily-cakes as prepared in Japan and China are in the Kew Museum. These cakes are used to flavor soups and as a vegetable, besides being supposed to have tonic properties. In the Consular Report on the trade of Chinkiang for the year 1886 it is stated that "The export of Lily-flowers has increased this year to 7,677,622 pounds. Not more than one-fifth is consumed here; the rest goes south, where it is used to flavor soup." In the *American Naturalist*, vol. xvi., p. 119, it is stated by Professor Penhallow that the bulbs of various species of *Lilium* are utilized as a source of food by the Japanese. In the Kew Museum there are examples of the food obtained from the bulbs of *L. cordifolium* in Japan.

I know of only two other recorded instances of the use of flowers as food. Of course by flowers the petals only are meant. The heads of the Cauliflower and the Artichoke are excellent articles of food, in which, however, the true flowers play a very small part. In India the flowers of the "Mahwa-tree" (*Bassia latifolia*) and of the "Phog" (*Caligonum polygonoides*) are collected and eaten by the natives. The "Phog" is made into bread, and Professor Church, who analyzed a sample of it, said that it contained more nutrient properties than rice and almost equaled Chick-pea. Mahwa forms an important article of food in many parts of India.

AMERICAN VINES.—In a recent letter I referred to the important place some of the species and varieties of American Vines now filled in those parts of Europe where the cultivation of the Grape is a staple industry. The destruction of this industry was threatened by the terrible Phylloxera, but by using the American Vines as stocks for the preferred varieties of *V. vinifera* this calamity has been averted. In time there will scarcely be a vineyard in Europe in which American Vines do not act as nurses to the best wine-producing kinds. The success of this experiment has induced other countries to follow suit, and I hear that for one of the Indian principalities 50,000 American Vines have lately been ordered from France. Has any one tried to cross *V. vinifera* with the best of the American kinds? Good results ought to be obtained in this way. Varieties possessing the constitutional peculiarity which

renders them indifferent to the Phylloxera and with fruits equal to the best of the varieties of *V. vinifera* would be of immense value.

NEW CHRYSANTHEMUMS.—The National Chrysanthemum Society this week awarded first-class certificates to the following:

Beauty of Castlehill (Japanese).—An English seedling. The florets are large, rich yellow, tinted with bronzy red. The general appearance of the flower suggests Boule d'Or.

Beauty of Castlewood (Japanese).—This is in the way of E. Molyneux and Mrs. C. Wheeler, the florets being large, broad, deep orange yellow on the one side, rich maroon on the other. The flowers are as good in form as those of E. Molyneux.

Danae (Japanese).—Large-flowered, the florets long, broad and twisted, and colored brilliant yellow, shaded with red.

Countess of Lytton.—Very near to Ralph Brocklebank, but distinctly primrose in color. It is a sport from Meg Merrilies.

A. C. Kingston (Japanese).—The flowers of this are large, compact and good in form, while in color they are rich crimson. This is likely to become popular as an exhibition variety.

Sunset (Japanese).—A large-flowered variety of fantastic form, the florets very broad and colored orange on the upper side, bright red on the lower, while the reverse is silvery.

Princess Waldemar (incurved).—A beautiful flower, medium in size, compact and regular, and colored a rich flesh pink. It is in the way of Eve.

Violet Rose (Japanese, incurved).—A handsome variety, the florets somewhat incurved, but not compactly so, and colored a bright rose-red. This is a distinct and promising sort.

Mrs. E. W. Clarke (Japanese, incurved).—A large-flowered variety, with the florets incurved somewhat regularly, and forming a rather high centre; the color is bright lilac or mauve. It is a first-rate addition to this section of Chrysanthemums.

A USEFUL INSECTICIDE.—All Orchid-growers know something of the ravages of thrips and the difficulty of keeping them under in Orchid-houses. Some plants, such as the green-leaved *Phalænopsis*, *Phajus tuberosus* and *P. Humboldtii*, *Miltonia vexillaria* and *M. Roezlii*, are only rarely seen without the accompaniment of thrips or their marks. Sponging, tobacco fumigation, tobacco solutions, snuff and other supposed remedies are not always to be relied upon; at any rate, such is my experience. I am pleased, therefore, to be able to recommend what has proved perfectly successful as an insecticide for Orchids—namely, an article sold here under the name of "Lethorion." It is in the form of a cone, which, when set on fire, burns slowly and produces a peculiar vapor which does not injure the most delicate Orchids, but effectually destroys insects. We have used it for *Oncidium*s, *Odontoglossum*s and *Masdevallia*s, and I know that it has been used for *Phalænopsis*, *Cypripedium*s and Orchids generally, and has proved effectual in every case. It is easily applied, and the only objection to it is the peculiar and somewhat disagreeable odor that remains in the house a day or so after its use. In this respect, however, it is no worse than tobacco. I have seen so many collections of Orchids suffering from the attacks of thrips, etc., as well as considerable injury done by attempts to eradicate the insects, that I gladly make known the value of "Lethorion" as proved by myself and others. I know nothing of the vender nor of the composition of "Lethorion," but I believe it can be had from most dealers in horticultural sundries.

London.

W. Watson.

Cultural Department.

Rose Notes.

THE short days of the year make an interesting period for the Rose-grower, because continual watchfulness is essential at so critical a time. Ventilation should be given whenever the weather will permit, for pure air is essential, and yet the oft-repeated warning against draughts should never be forgotten, for nothing is more injurious to the soft young growth of a Rose than a current of cold air. The plants should now be syringed early in the day, so that they may dry off again before night, otherwise they are liable to be chilled, and any check is felt at this season.

It is not prudent to keep the house at the same temperature during severe and more moderate weather; the extra fire-heat demanded to produce such a temperature in extreme cold seems to reduce the vitality of the plants, and it is therefore the usual practice among careful growers to permit the temperature of the Rose-houses to fall from three to five degrees lower on cold nights.

While on this subject of temperature it may be stated that all varieties do not flourish at the same degree of heat, and

for this reason it is best where the space devoted to Rose-growing is limited to limit likewise the number of varieties grown, for it is certainly better to grow two varieties well than to attempt to grow a dozen sorts in one small house and then fail with eleven of them. For example, Papa Gontier and American Beauty are seldom seen equally healthy in the same house, for the reason that while the former enjoys a night temperature of fifty to fifty-two degrees the latter is seldom seen at its best unless grown at fifty-eight to sixty. W. F. Bennett also seems to enjoy a moderately high temperature, and strange as it may seem in the case of a Hybrid Tea, still it is true that some of the best plants of this variety have been grown quite wet at the root. This rule as to moisture, however, may not be infallible, as the behavior of this variety varies considerably in different soils.

Among the earliest hybrid Roses to be seen this season are fair blooms of Mrs. John Laing, some of these having been in the market for two or three weeks past. Apparently this fine variety has only been distanced in earliness by the new pink

so well in South Carolina that some of our northern nurserymen take this means of supplying their stock. That is, they consider an establishment in the south for raising such varieties preferable to importing them from Europe. This system possesses the additional advantage that the home-grown stock is all on its own roots, whereas the imported Roses are almost invariably budded or grafted.

The use of wood ashes as a fertilizer in Rose-houses is again strongly advocated by some growers, and, while these are undoubtedly of value, yet it will not do to depend on them entirely. Wood ashes will certainly not encourage the spread of Fungus through a bed as an over-application of barn-yard manure will, and in a comparative test of two parallel beds of the same variety, in one of which the fertilizer was ground bone and in the other wood ashes, the evidence at the time I saw them, about October 15th, was in favor of the ashes; but, of course, it was too early in the season to accept this evidence as final.

Holmesburg, Pa.

W. H. Taplin.



A California White Oak (*Quercus lobata*).—See page 606.

hybrid shown by Mr. Julius Roehrs at the late Chrysanthemum Show in Philadelphia and at some other exhibitions. This latest candidate for honors as a forcing variety has thus far been shown without a name, and consequently has been claimed by some Rose-wise persons to be merely an old variety re-introduced, while others are equally positive that it is really new. Be this as it may, the flowers shown were of good color, size and substance, and the introducer deserves credit for making its good qualities known whether it be new or old.

The new Polyantha Rose, Clothilde Soupert, to which some reference has already been made in these columns, has created a good impression during the past summer, its charming little flowers being so freely produced that it will doubtless be largely planted next season. These miniature Roses have become very popular of late years for bedding out, and with good reason, too, for they are seldom out of bloom.

Wootton as an out-door Rose in this locality did not prove a success, but for forcing it is again on trial to a considerable extent, and as its needs are better understood it will probably pay for the experiment. Possibly this variety may do better out-doors in a more southern latitude, as several of the Hybrid Teas that cannot be grown to advantage here are now grown

The Calochortus in Cultivation.

IN my experience here the various species of Calochortus are hardy out-of-door plants. But eastern growers who use them for forcing purposes may perhaps gain some hints as to their cultivation by some statement of the conditions which here secure the best growth. In England they are hardy, and I believe that Messrs. Gillett & Horsford, of Southwick, Massachusetts, treat them as half hardy. I am inclined to believe that many species would prove half hardy in the east. *C. Nuttallii*, usually known as *C. Gunnisoni*, the true *C. Gunnisoni*, *C. macrocarpus*, *C. aureus*, *C. lugens* and *C. flexuosus* are natives of the Great Basin, and are occasionally subject to as low a temperature as twenty degrees below zero. It is a dry cold, and the bulbs are in loose sand from four to six inches deep. I have dug *C. Leichtlinii* in the Sierra Nevada at an altitude of 9,000 feet and a few hundred yards from snow banks that did not melt that season.

A snow-fall of a few feet is common where *C. nudus*, *C. elegans* and the Oregon species grow. Here on the coast range of northern California fourteen degrees above zero is the severest temperature experienced, and in it the leaves of

Calochortus suffer no injury although frozen stiff every morning.

It is seldom that two species of Calochortus are found growing together. In a given section of country but one type of the Mariposa Tulip is usually found and one or two species of the Star Tulips; the Mariposa Tulips in warm, open situations, the Star Tulips in open woods or shaded hill-sides. Each species seems to cling to its particular soil and exposure, and even varieties of the same species seldom intermingle. The following usually are native to a sandy soil with a mixture of mould: *C. aureus*, *C. macrocarpus*, *C. Nuttallii*, *C. flexuosus*, *C. Gunnisoni*, *C. Kennedyi*, *C. venustus roseus*, *C. Weedii* and *C. Palmeri*, among the Mariposa Tulips, and *C. albus* of the Star Tulips. *C. luteus* is native to a stiff, rich, clayey soil, that peculiar clay known in California as adobe. *C. splendens* and the varieties of *C. venustus* known as *oculatus*, *citrinus* and *purpurascens* are found in light shallow clays. *C. Leichtlinii* is alone found in decomposed lava, sand and ashes. Of the Star Tulips, *C. lilacinus*, *C. nudus* and *C. uniflorus* grow in the sandy loam of moist meadows; *C. pulchellus*, *C. Maweanus*, *C. Bentharii*, *C. cæruleus* and *C. elegans* are usually found in the light soil, gravelly or clay, of open woods.

The species I have named comprise nearly all of the cultivated species. Nearly all of the species named will stand much moisture during the growing season. The uplands where many of the Mariposa Tulips grow are at a saturation point for some time during the rainy season, and of course water stands on the meadows where *C. lilacinus*, etc., grow during the winter. But before the Calochortus are ready to blossom the water has dried up and the soil begins to bake. A few weeks later the plant is dried up or blown away and the soil is baked hard. Nature has provided the bulb with a protection from the heat and dryness in the shape of a fibrous covering which is thickest in the desert varieties. It will be found that as often as not the rootlets at the base of the bulb are dried up when the plant is in bloom; in other words, the growth has ceased, and it only awaits the ripening process.

In planting them the bulbs should rest on firm soil. I use boxes about ten inches deep and fill up to about four inches of the top with clay loam and tramp it down. I then plant the bulbs, using a little sand or loose soil to stick them in. I fill up with the soil I consider best for that particular species and press firmly. Take it as a whole, a mixture of sandy loam, with a little mould or finely rotted chips, will more nearly accommodate all species than any other mixture that I have tried. Mariposa Tulips need a warm, sunny situation, Star Tulips partial shade; but very good results can be had in planting side by side regardless of this. Of all the species that I have grown I have found *C. lilacinus* the most susceptible to cultivation, and next to it the varieties of *C. venustus*, especially *roseus*. *C. venustus oculatus* is wonderful in its variations in coloring, *C. venustus citrinus* is only different from it in color, and there are shades innumerable between the creamy white of one and lemon-yellow of the other.

To choose the most desirable from a number of species, all of which have the beauty and coloring of the Calochorti, is a hard undertaking. If I were to choose four they would be *C. Nuttallii*, *C. venustus oculatus*, *C. albus* and *C. pulchellus*, with an inclination to ask that *C. lilacinus* be thrown in as an extra.

Ukiah, Cal.

Carl Purdy.

Our Twenty "Best" Apples.

THE American Pomological Society's list of apples contains but twenty native sorts to the names of which are affixed the letter "b," indicating that, in the judgment of the Society, or of such of its membership as were present in the meetings where the quality of apples was under discussion, these alone are entitled to rank, as to dessert quality, above all other apples native to this continent. This list contains no sweet apples. As to season, four are summer, three early to late fall, and thirteen are winter varieties. In origin seven are from New York, three from Massachusetts, two from Connecticut, one from Pennsylvania, six eastern, with state unknown, and one probably from Ohio.

May it not be permissible and profitable to review this list with an eye to its amendment, and perhaps its increase, at some future meeting of our Society? May it not be true that in other states, from a wider range of country, there are apples deserving a place in this roll of honor? Perhaps a majority of the Society might favor dropping the names of a few which have ceased to be planted from cultural defects or because they are superseded by more desirable sorts. Mere high quality, or local preference, without other merit, ought not to admit to a

select fruit list endorsed by a continental society of practical fruit growers. The word "best" should not be made too narrow in its application here. The quality being the same, or equal, other merits ought, I think, to be taken into consideration. Beauty must not be entirely ignored. Adaptation to general or a wide range of cultivation is worth considering. Health and productiveness of tree are important considerations. Not that these should admit, but that the lack of them may exclude an apple which, considered merely on its flavor, would be a proper candidate. I think we may take Pomme Grise, for instance, as an apple of so few other merits that its excellent quality alone should not give it a place.

AMERICAN SUMMER PEARMAIN.—This fine apple, tracing its descent to an equally popular, but really inferior, English apple, is well entitled to its place. It has beauty, medium size and a fairly productive and healthy tree, requiring high culture, however, to develop the merits of the fruit.

BELMONT.—From all points here is a first-rate apple, of good size, great beauty, a healthy and productive tree, with a crisp, delicate and most agreeable fruit. Its season extends beyond the holidays.

BETHLEHEMITE.—Like the preceding, this apple is of unknown origin, and the excellence of both was first widely recognized in Ohio, this being named for an Ohio town, as Belmont is for an Ohio county. Downing thinks it plainly a seedling of Newtown Spitzenberg, which it much resembles. The tree is a good grower and productive, while the fruit, of medium size, is well formed and well colored. The flesh is juicy, rich, mild and aromatic. An all winter apple.

BULLOCK'S PIPPIN is the oldest American Golden Russet, also locally known as Sheep's-nose, a small, plain-looking apple, but of a most remarkable pear-like flavor. The flesh is yellow, tender, juicy, spicy and rich. Early winter. It does not always ripen up perfectly, and the tree is subject to disease. Perhaps this variety might be dropped from the "b" list, along with Pomme Grise, which seems to be a close relative.

COGSWELL.—Here is an old Connecticut fruit, and to it are assigned by the books almost every merit—a vigorous, productive tree, fruit of a size above medium, regular in form and size; a rich yellow color, well marked with red; fine grained yellow flesh, tender, rich, juicy, aromatic and a good keeper. Why is not such an apple more often found in the general market?

EARLY JOE.—A well known little August apple, which is often seen in market and deserves its place. Yellow, with red striping; flesh white, tender, juicy, vinous. A general favorite.

ESOPUS SPITZENBERG.—Downing says this Spitzenberg is considered by good judges equal to the Newtown Pippin; but our Society excludes the latter from a list where the former stands prominent. "Flesh rather firm," says Downing, and it is all of that. In fact, it is a hard apple that never softens until it decays, and its high flavor alone gives it a place here. It is really a "best" pie-apple. Unfortunately, the tree is not vigorous, and it is usually an unprofitable apple to grow for market.

FALL WINE.—This fruit is so subject to disease as to be not worth growing, except perhaps in a few localities, and I think it should be dropped, although a fine apple and the nearest to a sweet one that appears on this list.

GARDEN ROYAL.—Here is my favorite; and yet it must be said of it that it is strictly a garden apple, and worth growing only on the condition of high culture. It is of sea-side origin, and I have never seen it thriving so well as within the range of New England's fog-banks. The tree is healthy and productive, and with the high culture it requires I do not see why it may not be grown profitably from Portland, Maine, around to New York City. Wherever it can be well grown there is money in it. Season, August and September.

MELON.—A New York apple of good size, yellow, handsomely striped and shaded with red. Tree a moderate grower, and usually a good bearer. The fruit is of full medium size, often ribbed, but not prominently. Flesh white, tender, juicy, sub-acid, vinous. It bears handling poorly, but carefully packed it can be sent short distances in good order.

MOTHER.—Another apple of the Massachusetts coast which grows nowhere else so well. Smallish, conic, red. Flesh yellow, tender, rich, sub-acid. Rarely seen in market, yet common in private grounds and highly esteemed.

NORTHERN SPY.—It is difficult for me to understand why the Spy is taken and King of Tompkins left off this list. In quality the Spy varies greatly, and at its very best is better than the King; but not as usually seen in the market.

PORTER.—This is the favorite fall apple of Massachusetts and

when well grown its quality is certainly very good. It has, however, been to a great extent superseded by the Gravenstein, and growers call it an unprofitable apple in competition with that variety.

PRIMATE.—There is no better late fall and early autumn apple than the Primate, and it is easily grown.

RED CANADA.—It is hard to find fault with the old "None-such," and they still grow it large and fair in some parts of Michigan. But it is an apple very apt to "go back" on the planter. In New England and generally in the east it is a sad failure.

SPITZENBERG.—This (Newtown) Spitzenberg is much more to my taste than its brother of Esopus. The tree is more healthy and productive in the long run, and the fruit is not only rich, spicy and vinous, but it is tender and crisp.

SUMMER ROSE.—Here is a nice little apple, not much larger than the Lady Apple, and quite as good in its season, but no more worthy a place in a select list.

SWAAR.—A noble apple truly, as Downing calls it. No one will object to the Swaar; but few have the soil to grow it in perfection. It ought not, therefore, to be recommended for general cultivation.

WAGENER.—A good tree and a choice apple, provided the fruit is severely thinned. It is only so that it can be entitled to the place assigned it. As usually grown it is unprofitable and its high quality much obscured.

Let me conclude shortly with the query, Whether the time has not come to revise, prune and possibly somewhat to enlarge this list of America's "best" apples?

Newport, Vt.

T. H. Hoskins.

The Grape Market.

A CORRESPONDENT writes that "he does not understand why grapes should be so cheap when there is such a scarcity of other fruits." One reason for these low prices I attribute to over-production. This idea is often characterized as ridiculous, but that the supply exceeds the demand, except at the lowest prices, is evident to all observers. The area devoted to grape culture in New York State during the last decade has been immensely increased, and it is from this region that New York and the surrounding cities receive their chief supplies, and notwithstanding serious damage to the crop in some parts of the state from rot and mildew our markets have been flooded the past autumn with this fruit to an extent never before known.

Another agency in depressing prices is the immense quantity of unripe and inferior fruit sold. Purchasers become dissatisfied and disappointed after a few trials of such fruit, and many refuse grapes altogether on this account. Growers injure themselves and the market by putting out such fruit. The desire to be early in the market so as to command the highest prices often overreaches itself, unless the fruit is of excellent quality.

The growers are not always responsible for this inferior quality of their products, for it is a well known fact that soil and climate are important factors in this matter. New Jersey fruits as a rule are more highly colored and better flavored than the same kinds produced in western New York. The Concord, most widely disseminated of all our grapes, is of much higher quality grown here than there. It seems to improve, not only in this respect, as it comes farther south, but also loses its foxiness. This change holds good with other fruits, and is doubtless due to our longer season, and perhaps to the presence of more iron in our soil. I once took some Baldwin apples to a meeting of the western New York Horticultural Society which were so highly colored that some of the experts there questioned the correctness of their name.

This difference in the quality of fruits grown in different localities is apparent to persons of critical tastes who have given any attention to the matter. It is worth while to quote the results of six chemical analyses of Concord grapes made in 1885 by Professor G. C. Caldwell, of Cornell University: Three samples of New Jersey Concorde showed an average of 16.09 per cent. of sugar in the juice, and three of New York Concorde an average of 13.54 per cent. of sugar. The grapes found in our markets would doubtless show a much wider difference if submitted to the same test.

A few years ago, when the Niagara Grape Company began to solicit purchasers for their vines on the terms they had adopted, the plan met with a good deal of criticism. People who accepted those terms were laughed at for their folly in allowing strangers to get a mortgage on their lands in this way, and it was predicted that Niagara grapes would soon be as cheap as Concorde. The lapse of time has proved these prophecies true in part. Most of these so-called lunatics who bought

the vines early have realized a handsome profit from their venture. The past season, however, has developed the fulfillment of the prophecy as to the price, as Concorde and Niagaras have sold at the same price; and in fact these cheap Niagara grapes were not as good as good Concorde. The commission merchant who sold my Niagara grapes told me that it was hard to hold up the price when they could be bought on the same block at thirty cents for a five-pound basket. I bought one of these baskets which came from a vineyard in central New York. The clusters were of good size and compact, and the berries full and large, but a single taste was enough to show that for table grapes they were dear at thirty cents a wagon-load. It is little wonder that many Niagara grapes have been sold in this market for from fifteen to twenty cents a basket, although when expenses for commission, freight, expressage, packing and picking have been deducted the margin of profit for the grower must be very slender. It is grapes of this quality which depress the market and tend to ruin the reputation of any variety. Merchants do not regard quality as much as they should, and buyers generally try to force the best down to a level with the cheapest. It seems, therefore, that the only remedy for the present low prices is to increase the percentage of fruit of the first quality and reduce the production of inferior grades. When consumers find they are getting a fruit that is palatable and healthful they will buy abundantly. As it is they have reason to be suspicious of anything in the shape of a grape.

Montclair, N. J.

E. Williams.

Cattleya Percivaliana alba.—One of the few plants in existence of this rare and beautiful variety is now in full bloom in the collection of Mr. Hicks Arnold of this city, and it carries three handsome flowers well formed and of snowy whiteness except a rich orange stain in the throat. Each sepal is broad and flat, the petals round and furnished with a fine fringe. The lip also is broad and delicately frilled. The plant occupies a basket, and is suspended near the glass throughout the year. The ordinary form of *C. Percivaliana* is now enriching many collections with its showy blossoms, and is gaining popularity among florists as a useful and free-flowering species for cut flowers. It is very easy to cultivate, and in its native home is found growing at 4,000 to 5,000 feet elevation on rocks fully exposed to the sun. Three, four and sometimes five flowers make their appearance on a spike and remain a month in good condition. It will thrive well either in a pot or basket in a compost of good fibrous peat and a small portion of clean sphagnum with ample drainage. After the flowering period is past water should be sparingly given to ripen the new bulbs. During the summer months, the growing period of the plant, it should have a temperature of sixty-five degrees. A few degrees higher will prove beneficial, and a gradual reduction of water as the new growths approach completion will induce them to flower.

Summit, N. J.

A. Dimmock.

The Forest.

Value of Mountain Forests.

THE first and most important function of mountain forests is the preservation of the mountains themselves by clothing them with soil. The relation of mountain forests to the soil out of which they grow is curious and interesting. The soil now produces the trees, but the forest has produced the soil which now nourishes it. There was a time when there was no soil on the mountains of New Hampshire, nor on any portion of the Appalachian System—when the mountains were only ridges, slopes and summits of bare rock. They were composed wholly of mineral substances, of matter entirely inert and incapable of supplying food to vegetable organisms. There was not an atom of soil on the rocks of the whole region, and no vegetable growth of any kind. Then, when conditions permitted, Nature began a new order of things here with some of the lowest forms of vegetable life, resembling the lichens of our time. Some of these could grow here and there on the rocks, and whatever could grow would die and decay, but would not wholly perish. Some slight particles of its fibre or substance would remain undestroyed through all the changes of decomposition, and in the course of centuries or thousands of years a thin film of soil was accumulated here and there sufficient to nourish vegetation of a little higher character and organization than had belonged to the pioneer organisms.

How great the distance from that far beginning to the first trees! And very poor and inferior trees the earliest ones were, when they did appear, compared with those which make

our forests now; but they were the best that the still scanty soil would sustain. Ever since the leaves of the first trees began to fall the trees have been slowly adding to the deposit of soil which now covers the rocks, and which has reached the depth and productive potency required to sustain the noble forests of our own time.

The great stratum of fertile, life-producing soil which now lies folded around the shoulders of the hills is the result and accumulation of patient ages of dendral toil. Nature has wrought incessantly, through mighty cycles of time, to clothe the desert rocks with life and beauty, and in the untainted air of these lofty slopes and plateaus she now grows forests which are like the columned aisles of vast cathedrals. Ships which cleave the waves of every sea, and the cottages and palaces of mighty cities, with myriads of structures for man's varied industries, have been builded of the materials supplied by our mountain forests. The superior quality of the timber now grown, and the vast quantities in which it is produced, are effects of the wonderful fertility which the soil has attained. It is richer than ever before, but it has not reached the limit of possible productiveness. There is no such limit, indeed, and if our mountain forests were rightly managed they would forever increase in fertility, and the quality of their timber would be thereby gradually improved.

A forest is the only crop, so far as I know, which can be produced perpetually on the same ground without diminishing in any degree the fertility of the soil. It is a remarkable fact that a forest not only does not impoverish the soil out of which it grows, but that it actually enriches it. As the soil is thus improved it responds by producing superior timber. A mountain forest would yield better timber, and more of it, at the end of a thousand years of proper management than at the beginning, and proper management means and includes the cutting of every tree when it reaches its best estate.

FARMING IN MOUNTAIN REGIONS.

The entire effort at farming in mountain forest-regions in this country is often a most destructive and suicidal mistake. Much of the ground that has been cleared for cultivation in such regions is so steep that if forest-conditions are once destroyed upon it the soil is certain to be washed away. It has always been manifest to intelligent observers that such land is suited to the perpetual production of timber, and of that crop alone. In many instances in our state land has been cleared and "farmed" with very slight returns which would be much more valuable than it now is if it were still clothed with forest. The yield of farm products in such cases is scanty and uncertain. In some places the land is too high and cold for successful cultivation. There are frosts late in spring and early in autumn, and sometimes in every month of the brief summer, and the soil is soon exhausted. It would be difficult to find anywhere an instance of more obvious natural adaptation to a particular function than our whole mountain forest-region exhibits in its fitness for permanent forest-growth and its unfitness for any permanent beneficial use after forest-conditions have been fully destroyed. It would have been much better if some of our "abandoned farms" had never been cleared. In some parts of our country vast values have been permanently blotted out by clearing and cultivating mountain land, and those states will be poorer for all time to come by reason of the resulting destruction and removal of the soil of considerable areas of their mountain regions.

RUIN BY FIRE.

The most fatal agency in destroying the soil of a mountain forest-country, and in wrecking the mountains themselves, is that of fire, and in the history of most mountain forest-regions the operation of this agency has been closely connected with the attempts to cultivate the soil to which I have just referred. In various regions of the Appalachian mountain system many of the farms have been cleared simply by burning the timber and brush left on a tract after it has been lumbered over, and the first crop is planted in the ashes. In a few years the soil is exhausted or washed away, and the farmer goes a little farther up or down the valley, or across the stream which runs through it, and repeats the operation. But the injury to the mountains which is caused by the destruction of the soil of these limited tracts which have been cleared for cultivation is trivial when compared with the losses which have resulted from the forest-fires having their origin in these clearings.

When we consider the rapidly increasing density of the population of our country, and the great advance in the value of all fertile lands, especially in the eastern states, it is obvious that the complete destruction of the soil of any considerable area is a very serious matter. There are few kinds of losses or misfortunes affecting property which are so calamitous as

this. It is a crime against posterity, a permanent subtraction from the wealth and the capabilities of the country. The soil is, to a very great extent, the country itself. A burned city can be rebuilt, and the system of insurance distributes the loss widely. But there is no insurance on the soil of our mountain forests, and when it is once thoroughly burned it will require mighty cycles of time to restore it. Its producing capacity for ages, and all the "promise and potency" of a perpetual succession of valuable crops, are at once reduced to nothingness.—*From the Report of J. B. Harrison, Commissioner of Forests for New Hampshire.*

Correspondence.

A Good Tree for the South.

To the Editor of GARDEN AND FOREST:

Sir.—Your southern readers, perhaps, are not generally aware of the value of *Moringa pterygosperma* as an ornamental tree in the southern states. It is the Horseradish-tree of India, the fleshy roots when young being equal if not superior to the roots of the common Horseradish. Those in Mexico are highly prized and form a staple article of diet. From the seeds are prepared the finest "oil of benne" used by jewelers, and the seed-pods are said, when young and tender, to be edible cooked in soups.

The tree is a very rapid grower. I have specimens that are only four years old from seed and which are well bushed out and form excellent shade trees fully thirty-five feet in height with trunks from six to eight inches in diameter, while some of my young trees, planted only a year ago, are twenty feet high. The *Moringa* has graceful, ternately decomposed leaves, and produces, when only a year old or sometimes even earlier, clusters of delicate flesh-colored flowers resembling in size and shape those of the *Wistaria*, with a fragrance not unlike that of Sweet Peas. The flowers are followed by long pods which contain the triangular winged seeds.

I am much surprised that this tree is so little known in the United States, especially in the south. It is very easily propagated either from seeds or by cuttings, and it thrives on any well drained land of good quality. It can be grown in the north if plants are started in a greenhouse during the fall and then planted out in the spring. This tree will add variety to any garden through the summer and autumn, and when cut down by frost its roots can be dug up and utilized.

I consider the *Moringa* a very valuable addition to our list of ornamental and economic plants.

Villa City, Fla.

George T. King.

From a Foreign Creditor.

To the Editor of GARDEN AND FOREST:

Sir.—We shall be much obliged if you will inform us through your columns how an English firm can recover debts which are not forthcoming from America, whether by summons or in what manner, and whether the statute of limitation of a debt is the same as in England—six years.

Langport, England.

Kelway & Son.

[An American debtor can be summoned in any court where he can be found, either by an American or a foreigner. Practically, the best way for our correspondents to collect debts due them in this country would be to place the matter in the hands of a lawyer to manage. The statute of limitation of a debt is six years in this country.—Ed.]

A Weeping Maple.

To the Editor of GARDEN AND FOREST:

Sir.—Last summer a writer in the *Critic* made some inquiries concerning a peculiar Maple-tree which was standing in a long row of ordinary trees of the same species by the old Hopkinson place, in Bordentown, New Jersey. It was stated that this exception was a particularly large tree standing nearer the house than the others. Within about fifteen feet of it is the stump of a great Weeping Willow which was cut down many years ago. The large Maple seems to have the peculiarities of this Willow—that is, its leaves are more feathery than is usual with Maples, and its branches droop just as the Willow's did until they almost sweep the ground.

The inquiry was made whether the peculiar form of this Maple was due in any way to its proximity to the Willow. The matter was referred to GARDEN AND FOREST, but I have seen no response.

Trenton, N. J.

Q.

[It is not probable that the writer in the *Critic* had any belief in the "theory of re-incarnation" or that the Willow

had any influence in forming the Maple. But Professor A. C. Apgar, of Trenton, who visited the Bordentown tree not long after the note concerning it had appeared in the *Critic*, asked a resident of the neighborhood for a ladder in order to get a specimen of the "Weeping Maple," and he was at once told about the proximity of the Weeping Willow, which, according to the man's notion, completely explained the phenomenon. White Maples not rarely assume a somewhat drooping habit, and this tendency differs very widely in different trees. Professor Apgar writes that between the Hopkinson place and the station, which distance is not more than a length of two or three city blocks, there are three other Maple-trees which show a marked weeping habit. The one in question, however, is more decidedly pendulous than any specimen which has come under his observation. Some of the twigs, of which sketches were sent to this office, hang in as nearly vertical lines as those of any of the so-called "weeping" trees. One twig with over thirty-six inches of growth for the current year shows that the Maple is a vigorous one. Specimens of the leaves which were sent differ little from those of ordinary White Maples, although they may have been a trifle more deeply cut. In this particular, too, the leaves of this species vary considerably.—[Ed.]

The Kansas Horticultural Society.

Orchards on the Prairies.

DURING the three days' session of the Kansas State Horticultural Society, which began at Topeka on December 2d, the usual wide range of topics was under discussion, but throughout the entire meeting it was easily seen that the subject of paramount interest was that of the Apple-orchard, and especially the growing of market sorts. This was doubtless due in part to the shortage of the apple crop in the east and the presence in Kansas last fall of a host of eastern buyers who took the surplus of apples at high prices. Much had been published in state papers about the Wellhouse Orchard of Leavenworth County, and when the manager and part owner, Mr. F. Wellhouse, of Fairmount, took the floor as chairman of the Standing Committee on Orchard Culture he was plied with numerous questions relating to every feature of the great enterprise. From his replies and from additional information kindly given I gathered the following: The orchard is owned by Messrs. Wellhouse & Wheat and contains 437 acres of trees in bearing, planted in 1876, 1878 and 1879. Of the principal varieties planted Ben Davis occupies 225 acres, Missouri Pippin seventy acres, Winesap seventy acres, Jonathan forty acres, Cooper's Early White sixteen acres and Maiden Blush sixteen acres. In 1889 and 1890 of Ben Davis 370 acres were planted, Missouri Pippin 260 acres, Jonathan 120 acres, York Imperial fifty acres and Ganot twenty acres. There were planted in the older orchard a total of 52,000 trees, of which it is estimated that 40,000 are alive to-day. The heaviest loss occurred from the effects of the winter of 1884-5. With a very wet fall the trees made a late growth and went into the winter full of unassimilated sap. With the mercury at twenty degrees below zero during January many of the trees burst their bark, others were split through the trunk. Many that did not die from this injury the next season only lived a year or two longer. The loss from this cause was greatest among the Ben Davis trees, amounting to about fifteen per cent. of the whole. It will be seen that the number of trees planted gives about 119 to the acre. It is but fair to say that Mr. Wellhouse now regards this planting as too close, and their young orchards mentioned above are set sixteen feet apart, in rows thirty-two feet apart, running north and south, which will admit of thinning one-half if found desirable.

The location of these orchards is upland-prairie of average fertility, the subsoil being a red clay containing considerable sand. Mr. Wellhouse advises cultivating the land to corn till the trees come into bearing, after which he would seed to Red Clover. Stock should be kept from the orchard, especially hogs, as their tramping packs the ground, and by rubbing and rooting about the trees they do a great deal of damage. The Clover-crop is not removed from the orchard, but with a long machine resembling a stalk-cutter, but with smaller diameter, the weeds and clover are cut and allowed to remain on the ground, the object being to secure a loose, mellow soil among the trees, resembling a forest-bed as much as possible. Spraying with London Purple in the proportion of one pound to 100

gallons of water was tried last year to destroy the codling moth. A part of the orchard was sprayed twice and the rest three times; but the third application seemed to scald some of the leaves without being of any benefit.

Mr. Wellhouse has discarded, as useless for his purpose, all the spraying machines and nozzles upon the market, and he uses a tank fifteen inches deep, three and a half feet wide and four and a half feet long, slung between the wheels of a wagon. Upon this is mounted a common rotary pump, operated by means of a sprocket-wheel and chain from one of the hind wheels. This gives a positive action, starting the spray the instant the wheel starts and stopping it as quickly, avoiding the unpleasant waste and drip occasioned by the pressure from the air-chamber of the force-pump. The nozzle finally adopted is one of their own construction, having a fine slit in the casting resembling a gas-burner. This gives a broad, fan-like spray, and enables the operator to cover one side of the row of trees in driving by, at the same time managing the team. Ponds for collecting surface water to be used in spraying are constructed at convenient distances by damming ravines or draws. A man and team spray 160 acres in about five days. Adding to this the cost of poison and it brings the cost of spraying once to about fifteen cents per acre.

Everything in connection with the enterprise is reduced to the most careful system, and an accurate account has been kept of all expenses and receipts since the planting of the orchard. The actual yield of so large an orchard, over a period of eleven years, is a matter of much interest, and I am permitted to give you the following figures: In 1880, 1,594 bushels were gathered; in 1881, 3,887; in 1882, 12,037; in 1883, 12,388; in 1884, 11,726; in 1885, 15,373; in 1886, 34,990; in 1887, 33,790; in 1888, 20,054; in 1889, 11,952; and in 1890, 79,170 bushels. The last crop, it will be noticed, is more than double that of any previous year. This, at the high prices which ruled, gave a gross income of about \$50,000. The entire outlay for the year, including barrels for shipment, amounted to \$14,000, of which \$7,000 were paid for picking. This left a net profit of \$36,000, or \$82.38 an acre, which gives considerable color to the story which went the rounds of the press during the fall that the crop from many Kansas orchards this year had sold for more than the entire land was worth.

His Jonathans gave Mr. Wellhouse the best prices, bringing from \$3.50 to \$3.75 a barrel of three bushels. Ben Davis, Winesap and Missouri Pippin were contracted to eastern firms at \$3 a barrel. During the entire eleven years the Missouri Pippin has taken the lead for profit, and this year's returns placed it still further ahead. The Winesap they have not found as profitable as the other sorts, the size of the fruit averaging too small, and it is not included in their new plantations. The York Imperial they regard as a promising apple for their locality, and they are planting it quite extensively. The Ganot, a new apple originating with a fruit-grower of that name near Lee Summit, Missouri, was mentioned with much favor by Mr. Wellhouse. It is described as closely resembling the Ben Davis in tree and fruit till the latter begins to color, when it takes a much deeper color, has more yellow and firm flesh, and is generally conceded to be a better keeper. Mr. Wellhouse closed his remarks by adding, very aptly, that he was looking with a good deal of interest for the coming apple, and wanted to get some trees of it to plant.

In the general report on fruits from different parts of the state the Winesap received rather better treatment, and will doubtless continue to be planted largely as a reliable late keeper of much better quality than either Missouri Pippin or Ben Davis. Rawle's Genet, except in a few favored localities, was declared to crack and rot badly on the trees, besides keeping poorly after it was gathered. It is being largely discarded.

An instructive paper prepared by Professor L. H. Bailey, of Cornell University, entitled "Causes Affecting the Longevity of Orchards," was read by the Secretary. The ground taken was that the supposed greater longevity of old seedling orchards in the east was more apparent than real; the trees which attracted attention being the few fittest to survive, while the many which perished prematurely escaped notice. The popular cry against root-grafting on stocks from pomace seed, as tending to deteriorate the vitality of varieties, had no foundation in fact. The even stand and uniform character of trees in modern orchards showed that the cion either dominated the stock or had become self-rooted. The short life of many orchards in the west must be accounted for by the fact that they were in a prairie region beyond the limits of natural forest-growth.

The general opinion of the members of the Society seemed to be that while the older orchards of the state show that they are destined to be short lived, we should not be discouraged by this fact. With the abundance of comparatively cheap land in

the state and the small outlay needed for planting, young orchards should be set as fast as the old ones show signs of failing, and the supply of vigorous, bearing trees kept up.

It was thought that the rapid development of the country to the north and west beyond the range of profitable Apple-culture must give a market for Kansas apples at paying prices for a long time to come.
S. C. M.

Notes.

Another use has been found for the bark of the Cork Oak. It seems that in Europe "cork concrete," made of ground cork mixed with a cement that is called "liègine," is somewhat extensively used in building. It is said to be as strong as the porous terra cotta which is known as "terra cotta lumber," to be better in its capacity for holding nails, and also as a non-conductor of sound, and almost equally fire-proof.

We have received a photograph of a superb specimen of *Phalenopsis Schilleriana* grown by John Hosken, Esq., Q.C., The Dale, Toronto, Ontario. The plant carries seventy-five fully expanded flowers. A visitor who has seen it states that the flowers show great substance and breadth of petal, while the leaves were nearly two feet in length. The plant grows at will in a perforated pot, and a large tank under the bench near it is constantly full of water.

The annual meeting of the American Forestry Association will be held on Tuesday, December 30th, at the Department of Agriculture, Washington. At the morning session officers for the ensuing year will be elected and general business transacted; in the afternoon there will be another session for discussion and business; and in the evening a session will be held at the National Museum conjointly with the American Economic Association, where papers on the proper treatment of forests on the public lands of the United States will be read and discussed. It is particularly desired that as many of the Vice-Presidents as possible will be present.

A fine mass of the beautiful and fragrant, rose colored flowers of *Luculia gratissima* was sent to a recent meeting of the Massachusetts Horticultural Society from Mr. Hunnewell's gardens at Wellesley. This handsome evergreen shrub is a native of the temperate regions of the Himalaya and has long been a favorite in English gardens. It is particularly valuable because it flowers at a season of the year when flowers are scarce. *Luculia gratissima*, nevertheless, and this is true, too, of the second species of the genus, the still more beautiful *L. Pinceana*, is very rarely seen in this country. Both species can be successfully cultivated in pots, although they do best when planted out in a border in a moderately warm greenhouse.

Popular Science News gives a report of the meeting of the British Association for the Advancement of Science, held recently at Leeds, from which it appears that a large part of one day was devoted by the biologists to a consideration of the subject of teaching botany in schools, introduced by an able paper by Professor Marshall Ward. Botany, he urged, should be taught, not in order that names and facts may be committed to memory, but that habits of accurate observation may be acquired by the pupil, and great principles and laws grasped which in future may be applied under any special conditions. In these views he was supported by the eminent biologists present, who, one and all, agreed that it is time to leave the blind worship of facts, and, instead of measuring a scholar's progress by the amount of dogmatic information imbibed and put into an examination paper, to look to his understanding of the relation between facts and the intelligence with which he describes what he sees.

A *Tribune* correspondent writes that 10,000 tons of fresh, dried and canned fruits have been sent overland by rail from California during the season, and this enormous amount does not include what went by express. As much of the finest perishable fruit was expressed, this probably amounts to 100 car-loads. The value of these overland fruit shipments is roughly estimated at \$10,000,000. Of prunes California shipped 15,000,000 pounds, and of raisins 40,000,000 pounds. Four thousand car-loads of oranges will be sent east this winter, an increase of 800 car-loads over last season. The first car-load shipment of oranges this season went from northern California, where five years ago it was declared that Oranges could not be grown except in gardens protected by hedges. This initial shipment came from Oroville, Butte County. A new feature this year is the shipment of early winter vegetables to the east,

the railroads having made a favorable rate. Especially in Los Angeles and other southern counties this promises to be a great industry.

It is not generally known, says a writer in *Nature*, that the Chinese grow the *Chrysanthemum* as a standard tree, especially for selling. They graft it upon a stalk of *Artemisia*. There is a species of *Artemisia* that grows wild and covers the waste ground round Pekin; it springs from seed every year, and by the autumn attains to a tree eight to ten feet high, with a stem one and a half inches thick. The Chinese cut it down, and, after drying it, use it as fuel; the small twigs and seeds are twisted into a rope, which is lighted and hung up in a room to smoulder for hours; the pungent smell of the smoke drives out the mosquitoes. This plant, after being potted, is cut down to about three feet, and used as the stock, the twigs of *Chrysanthemum* are grafted round the top, and it quickly makes a fine tree, the flowers grow and open, and as the stock soon withers the whole tree dies, and folks say, "Another ingenious fraud of the Chinamen." A favorite style of growing *Chrysanthemums* is in the shape of a fan, with eight or ten flowers in different parts of it. If the flowers are not grown on the plant, they are tied on, which also does for selling. The winters in Pekin are very cold and last about four months, and having no glass houses the Chinese gardeners do not have the chance of producing such a variety or such fine flowers as their European brethren, but in the case of *Chrysanthemums* they have many curious and beautiful varieties.

M. Charles André, in *Le Journal des Orchidées*, gives an account of his experiences when on a botanical expedition by the shores of the River Amboan, which, though interesting to read when safe at home, gives a good idea of the unexpected dangers often incurred by botanical collectors. M. André was in search of *Celogyne asperata* and happened to be in a Dyak hut when the natives were sorting rice preparatory to sowing it. In the evening a noisy procession entered the hut, and the females who were among them laid with much ceremony large bouquets and garlands of the longed-for Orchid on and around the stores of rice. Such was the quantity of the blooms that the perfume was so powerful as to drive the explorer out of the house to spend the night in his boat. He afterward heard that seed-time as well as harvest is an important season to the natives, who are dependent on their crops, and that he had witnessed rejoicings caused by the abundance that year of the *C. asperata* blooms, which were believed to herald an equally fertile harvest. When, some time later, M. André returned to the spot with (among other treasures) a load of the all-important Orchid, he found himself the subject of passionate grief and hatred, and that his only chance of safety was in a generous distribution of money and tobacco and a speedy flight. He had, in the opinion of the Dyaks, committed an act of sacrilege in gathering plants sacred to them, and whose lives they believed were in some way connected with their own.

In "The Resources of Southern Oregon," collected and prepared by the Southern Oregon State Board of Agriculture and recently published at Salem, there is an interesting account of the forests and forest-trees of southern Oregon from the pen of Mr. E. W. Hammond, of Wimer. The forests of southern Oregon are composed chiefly of conifers, containing some of the noblest and most valuable trees known to man, and although these forests do not occupy comparatively a very large area, being confined principally to the Cascade range of mountains, with an average width of about thirty-five miles, and to the coast ranges with an average of about thirty miles, they contain vast quantities of timber. The whole area covered in the state by these two forest-regions Mr. Hammond estimates as 16,000 square miles. "These large forest-areas," he says, "secure an abundant flow of water in the streams both in summer and winter, even in the driest season. Their simply commercial value, if the timber should be cut from them and sent to market, would have been sufficient to have paid the national debt twice over at the highest figures—that is, at \$10 per 1,000 feet, the lowest price at the mills of the coast pine and fir lumber, it would amount to \$4,000,000,000, for it is estimated by competent judges, after a careful survey of the whole region, that the quantity of the merchantable timber yet standing in the two great forests of the state amounts to no less than 400,000,000,000 of feet." Mr. Hammond's note of warning against the wanton and useless destruction of these forests now going on cannot certainly be too often or too loudly sounded. The welfare of the north-western states depends more upon the preservation of these forests than upon any other one thing.

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Country Roads.

DURING the autumn which has just passed a correspondent of the *Hazleton* (Pennsylvania) *Plain Speaker* gave a description of a typical country road which attracted much attention. The road in question climbed slowly up a mountain with a grade which made drainage perfectly easy. In the County of Luzerne conglomerate rock and red shale abound and furnish such good material to pack hard under travel that there is no excuse for anything less than a smooth wheelway. And yet it was said that the road was rendered almost impassable in October by half liquid mud, in which the wheels of a light wagon sank to the depth of eight inches. This was not because the road had been left to itself, but because it had been laboriously repaired with cart-loads of black mould and clay scooped out from the road-side and shoveled upon the track. Of course, the road-bed became a continuous mass of mud after every rain and a stretch of blinding dust in every dry time, and as cold weather comes it will freeze into iron ridges, and nothing but the merciful snow will cover up its iniquities. Unfortunately, there is nothing singular about this Pennsylvania highway. All through the United States our people drive through mud and dust, to their discomfort, a great portion of the year; and yet the annual cost of repairing vehicles, added to the value of time wasted and the expense of extra horse power used in hauling loads, would give us, as a rule, passable highways.

Now a road that is permanently good must be properly made to begin with, and in the second place proper measures must be taken to keep it in constant repair. But no such attention has been given to the construction or maintenance of one mile in a thousand of our ordinary country roads. There was originally some excuse for this. The first roads were built when the country was thinly settled and anything like the expense necessary for a well constructed bed with adequate drainage was not to be thought of. Perhaps, too, the old plan of mending the roads, under which the farmers of a district assembled with hoes and

shovels to do their road-mending all at once for the entire year was a most natural and economical plan. But in the older settled portions of our country, where the population is no longer scattered, no reasonable excuse remains for making a poor road or for tolerating improper road-mending.

It is encouraging to find that public opinion is making strenuous demands for reform in this direction, and in addition to improved road laws which were passed in half a dozen states last winter, we may probably hope for still more effective legislation in twice as many states at the next meeting of their Legislatures. Without stating here any of the fundamental principles which should govern the construction of roads, it is plain that such work should only be done by experts trained to the profession. The roads which have been famous for generations were built by engineers on scientific principles, and the fact that in several of our agricultural colleges a course of road-engineering is obligatory indicates a hopeful direction in current thought. The fact, too, that in so many states the old district system has been abandoned, and that skilled officers have been appointed to take charge of the roads of an entire district, is certainly a great step forward; and this, with the available machinery at command, which is multiplying in every part of the country, and the inspiring example which every mile of good road exerts on its vicinity, makes it probable that our improvement in this matter will be more rapid than we dared to hope a few years ago.

In the state of Pennsylvania this road question has been a matter of such special agitation that a legislative commission has been examining the subject in all parts of the state, and they have practically agreed upon an act to be introduced at the approaching session of the Legislature. By the terms of this act three commissioners will be selected in each township who will have the power to appoint and pay road-masters. Farmers who choose to work out their taxes must notify these commissioners before the 13th of April; they will not be allowed to work at their convenience, however, but will be required to report at such times and places as are designated by the road-masters, and on failure to comply with these terms their tax will become payable in cash. This to a certain extent puts road-construction and road-mending under something like expert control. The next provision of the act is that in addition to the annual mending of the roads a certain portion of the money collected for this purpose shall be set aside for permanent improvement. Wherever one mile in a township has received such thorough construction, that is, wherever the road has been built on a stone or gravel foundation with a covering of such metal as is approved by the county engineer, the county will be required to build an additional mile of permanent road in the same township, and the state will be required to construct another mile. The Attorney-General of the state announces that there is no legal objection to the appropriation of state funds to the permanent improvement of roads, and it is plain that local enterprise will thus be encouraged. The state authorities with those of the county and of the township will be placed in competition, and there is no reason to doubt that the miles of good road in the state will be rapidly multiplied.

Meanwhile, in order to increase the general knowledge on this subject, the University of Pennsylvania has offered a prize of \$500 for essays on road-construction and road-mending, and the publication of the most useful of these essays is promised at an early date. Such a book ought to prove of great value just at this time if the state is to inaugurate anything like a general improvement in its highways. The initial expense will, of course, be considerable, but it is believed that the state will have ample funds to meet the townships and counties in competition. That these improvements will pay for themselves in a few years there can be little question. In a recent number of the *Philadelphia Inquirer*, which contains a clear statement of the whole project, there appears a quotation from a paper read before the State Board of Agriculture by Mr. S. R.

Downing, one of its members, in which he shows that if drainage and repairs to the roads are made at the proper time, it will save each tax-payer under the present system from twenty-five to fifty per cent. of road taxes. This means that the present labor tax is enormously wasteful. The cost of maintaining the average township road in the eastern counties of the state is estimated at \$1,500, of which \$1,200 are spent in wages for work done late in the spring, to suit the convenience of farmers, after gulleys have been deepened and much destruction has been allowed by this neglect. It is further shown that four men by draining and filling at such times as their work is needed could keep the same roads in repair by eight months' work at a saving of \$410—that is, a land-holder who pays \$20 road tax under the present plan would save \$6.75 under the cash plan, or if the service lost to the farmer is added, the total waste will be more than \$10 out of every \$20 of taxes paid.

Bad roads are expensive roads; improper maintenance is a shameful extravagance; in too many instances the men who are paid for repairing roads should in justice be fined for obstructing them. Any revolution in law or practice which will ensure to our people such roads as are common throughout Europe will materially lessen the expense and add to the comforts and pleasures of country life.

The North Woods Thirty-six Years Ago.

WE chanced not long ago upon a book called "Hills, Lakes and Forest-Streams, or A Tramp in the Chateaugay Woods," written by S. H. Hammond, and published in 1854. The author's name is not now familiar, and his work has no great literary interest, being a simple account of a summer outing, written by a man who evidently enjoyed Nature and a wild life keenly, but had no desire to collect statistics of any sort or describe the scenes he saw in anything more than a general way. But his words have, incidentally, great documentary value, as proving how short a time it has taken to bring the Adirondack woods into their present condition of semi-ruin.

"If," he says in the preface, "the reader will lay before him a map of the counties of Clinton, St. Lawrence, Franklin and Essex, and, beginning at the Chazy Lake, run his eye thence along to Bradley's Lake, then to the Chateaugay, then west to Ragged Lake and Indian Lake and so down through the series of small lakes to the St. Regis and then to the Saranacs, and down along again through three small lakes to the Racquette River, and then down that beautiful water-course to Tupper's Lake and to Long Lake, . . . he can trace out a circle of some 200 miles in circumference enclosing natural scenery the most wild and romantic, lakes and rivers the most beautiful imaginable. I was out there several weeks in the woods, along the streams and floating on those beautiful lakes, and saw during that time no face of a white man save that of my guide." In short, when this book was written all this "broad sweep of country containing millions of acres was a perfect wilderness." That was only thirty-six years ago. What is this country now? From Upper Chateaugay Lake, only a few miles south of the St. Lawrence, where the banks have been wholly stripped of trees by the charcoal-burners, to the southernmost limits of the area described, devastation has made its way—here total, there as yet but partial, but everywhere sufficiently apparent to mean distress to the eye of the lover of Nature, and imminent danger to the mind which knows the value of our water-courses and their intimate dependence upon the forests of elevated regions. Thirty-six years ago the traveler had to construct his own canoes on lakes where now tourists swarm by the hundreds, where the railway whistle may be heard, and where the lumberman and charcoal-burner are ubiquitous, an axe in one hand and a torch in the other. Ignorance, carelessness and greed have worked hand in hand during the life of one generation only, yet the wreck they have wrought no statistician can compute and centuries of the un-fettered ministration of Nature could not undo.

When we read of the primeval Adirondack forest in those old journals, where the experience of the first missionaries is embalmed, we do not think of it as a possession which once was ours. It seems to have belonged to far-off ancestors for whose ill deeds we are not responsible, and whose aims and methods, we fondly fancy, were inferior in intelligence to our own. But when we see that this primeval forest stood intact

thirty years ago we begin to realize our responsibility for past sins, and, which is still more important, we gain a fresh sense of future danger. Such agencies as have been active in this forest do not carry on their work in simple arithmetical progression. If a certain amount of damage is done during one year, the next year will see, not a similar, but a vastly greater amount. If thirty years have accomplished the ruin we now behold, thirty more years, with the same agencies at work unchecked, will more than suffice to sweep the Adirondack forests off the face of the earth—to put them in the same category as those so-called forests of England, where to-day sees only wide wastes of underbrush and an occasional isolated Oak or Beech. A letter from an American traveler which we read last summer described a drive in the south of France near Nimes which, according to the map, traversed a "forest" for miles and miles. "We could not exactly agree about it when the day was over," said the writer; "my wife insists that the forest contained seven trees; but she is an optimist by nature—I only counted six." This sounds like farce, but it is simple truth. And if present methods of procedure remain unchecked there will certainly be vast districts of Adirondack forest which, thirty years from now, a traveler may truthfully describe in a similar way.

The Autumn Flora of the Lake Michigan Pine Barrens.—III.

THOUGH the Sunflowers have mostly disappeared from the barrens, two of them are still found upon the ridges, *Helianthus divaricatus* and *H. occidentalis*. The former has a rough stem and leaves, and rather small flowers. The latter has an odd appearance for a Sunflower, by reason of its leaves being mainly near the root, the stem being nearly naked above, giving to it a scape-like aspect. It is not seen in as great numbers as the former.

Of *Prenanthes*, three species may be found in favorable localities. Among the low bushes in the richer ground *P. altissima* and *P. alba* are not uncommon, and in considerably drier localities *P. racemosa*. In the companion genus, the common Hawkweed for September, is *Hieracium Canadense*, growing like most of its kind in the dry grounds.

Two *Polygonums* may be deemed specially characteristic, both small and of slender but erect habit, with slender branches and very narrow leaves. They are *Polygonum tenue* and *Polygonella articulata*. *Polygonum tenue*, though rarely more than a foot in height, has long, simple branches more or less provided with small white flowers. The *Polygonella* is commonly of about the same height, but is sometimes taller. Since the leaves become disjointed and fall off it has a naked look. The erect branches are abundantly furnished with small, but yet showy flowers, as they are often very bright colored. In the barrens they vary much in color. The tints run from red through rose and flesh color down through pale pink to white. Some years white will be the predominating color, or white tinged with pink; in other years white will scarcely be found, the rose shades characterizing the flowers. Those which appear latest in the season seem to have the brightest colors. Both plants succeed in the driest locations, where the sands may, at the time they are in bloom, bear few plants besides them.

Lobelia Kalmii continues to blossom in the damp sands during the early fall, the smooth and slender stems showing a spike of pale blue but delicate little flowers. In the adjoining dryish ground will be seen specimens of *Buchnera Americana*, a taller plant, with an erect stem, generally without branches. It is a rough plant, and has a spike of small but deep blue flowers raised above the sparse grass amid which it is apt to grow. But it, like the *Lobelia*, is more characteristic of the late summer flora.

A papilionaceous plant yet persists in flower by the shore of the lake, though in other localities in seed or beyond that stage. It is our most common Prairie Clover, *Petalostemon violaceus*. The dense spikes of violet flowers, though much less abundant, are as complete as they were earlier in the season. It is established everywhere upon the sand ridges, and its foliage of fine and pretty leaflets keeps fresh and green till late in autumn, yielding only, like *Artemisia*, to the hardest frosts. Its form and habits, especially when close to the shore, are quite different from what it takes in the grassy prairie, where its natural home is deemed to be, and where it is single-stemmed, or nearly so. But in the sands it strikes downward with a strong, branching root, sometimes nearly an inch in diameter at the crown, the size corresponding to that of the plant. From this root rise several stems (the most I ever counted, twenty-six), forming a roundish bunch that may measure a

foot and a half across. Having this habit, few plants when it is in full bloom on the nearly naked sands are more striking than this mass of violet color. It crowds down to the shore nearly as far as the waves will let it, and attains its greatest vigor on the lakeward side of the ridge of sand which skirts the water. If the same effects could be reached by cultivation it would be a very ornamental plant both from flowers and foliage. The sand is almost purely siliceous, being carried away by car-loads for use in the best masonry as the "sharp lake sand" of the architect and builder. But this sand, at least near the surface beside the shore, is not devoid of organic matter, though in such a finely divided condition as to mostly escape detection by the eye. But dead fish and vegetable matter are continually washed ashore, and their decay must furnish nourishment to plants which grow where they have lain. They have plenty of room in which to grow, and from their location are supplied with considerable moisture, both by capillary action from the saturated sand below them and by the moist air rising from the neighboring waters. Besides, the free play of the winds around the plants and their exposure to abundant light, almost dazzling as reflected from the sand in the full blaze of the sun, doubtless have much to do with the symmetrical grouping of the stems. In fact, this roundish or bunch-like habit, and this tendency of plants to throw out several stems from a common root, is characteristic of several others near the shore, which grow there exclusively or crowd down to it from stations farther off, where they may be nearly or quite single-stemmed, and such illustrations of this may be instanced as *Prunus pumila*, *Cnicus Pitcheri*, *Solidago humilis*, *S. nemoralis* and *Artemisia Canadensis*. The plants are not crowded, each has plenty of room, and, like trees in the open fields, they freely develop in all directions, the forces acting on them being in equilibrium.

Another lingerer from the summer may still be seen in considerable quantities upon the ponds during a week or two of September—the White Water Lily. The only one I have detected here is *Nymphaea reniformis*.

It is now the proper season of another showy plant, *Physostegia Virginiana*. Its natural home is in rather moist and usually grassy ground. It has an ample spike of long flowers, with an inflated, trumpet-shaped tube. They are pale rose, more deeply colored on the upper side by darker lines, and stand out horizontally from the stem with gaping mouths. In the bud these form four rows, one on each side of the square stem, but as they expand they turn toward the sun so that the spike is at length one-sided. It is a very smooth plant, with thick, dark green leaves, and is handsome throughout.

Some of the Dodders continue in flower, attracting attention by their tangle of orange-colored, thread-like stems, bearing numerous clusters of pale or colorless flowers of a delicate cellular texture. *Cuscuta Gronovii* and *C. glomerata* are the principal ones. The former is parasitic on herbs and small shrubs in damp, shaded locations, the latter almost always on *Compositæ*, especially Golden-rods, in more open situations. In the fruiting stage it is conspicuous for the rope-like coils around the stem of the host-plant, made by the dense and continuous masses of globular capsules.

Growing among the low shrubs, beside the sloughs and in the moist land a tall Thistle is common, *Cnicus muticus*. It has long and slender branches, ending in a handsome, middle-sized head of bright purple flowers. The viscid scales of its compact and shapely involucre are not the least notable of its features. Its leaves are few and distant, its peduncles long and naked. When it attains a height of five or six feet, as is often the case, raising the many heads of flowers far enough above the shrubs to obtain a background of green from the stunted Pines near at hand, it presents a pleasing picture, and this Thistle will not be despised or soon forgotten when seen in its native settings.

Some tall Grasses now in flower on the sand ridges must not be overlooked. They are *Andropogon furcatus*, *A. Virginicus* and *Chrysopogon nutans*. The first is about three feet high, the last two usually from four to six feet. All are of a glaucous green hue, and provided with long, narrow leaves. The two taller are the most striking in appearance, the culm of the *Andropogon* ending in a diffuse panicle of digitate spikes, feathery, with white, silky hairs; that of the *Chrysopogon* in a graceful, oblong panicle, with shining, russet brown hairs. Though the stands of the *Chrysopogon* are distant from each other, and the Grass is scattered along the open ridges, there are enough of them to give character and animation to the scene, especially when the tall stems are waving in the wind. As an ornamental Grass in the Pine-barrens, this "golden bearded" one takes precedence of all that grow there at any season of the year. Another curious Grass is met with more

commonly on the higher ridges, being particularly characteristic of the thinly wooded dunes, *Aristida tuberculosa*. It is but ten to twenty inches high, and is remarkable for its flowers bearing three long awns twisted together at the base and widely divergent above. As they point every way, when in fruit the stem has a kind of chevaux de frise look from whatever side it is approached.

I have noted only the more striking features of the autumnal flora of the Pine-barrens. It is one of the four periods into which the season of flowers may be divided, noticeable changes occurring so as to distinguish them from each other. A kind of pause takes place, and then a different set of plants flourishes, giving to the flora quite a distinct facies. These appearances and changes are evidently due principally to variations in heat and moisture. The four periods may be called that of spring, from the opening of the season till about the 1st of June; the early summer, lasting from four to six weeks from the close of the former; the summer, continuing through the warmest and usually driest part of the year, the season of occasional showers, and ending about the last of August; the autumnal, or remainder of the year, as described in these articles.

Englewood, Chicago.

E. J. Hill.

Basket-Work of the North American Indians.—I.

PROBABLY the most generally diffused handicraft among our Indian tribes is that of basket-making in its various forms; it is that which subserves the most useful purposes, and in which they have acquired most skill. This native art, at first simple and rude to meet the requirements of savage and nomadic life, has been steadily growing and improving and has attained remarkable ornamental developments.

The collection of native basket-work in the National Museum is exceedingly interesting in the number and diversity of its types, a mere enumeration of which is only admissible here: dishes and plates, bowls, roasting-trays, jars and water-bottles, mats, wallets, wall-pockets, hats (often of exquisite pattern), hoods for papposes; baskets, of forms innumerable, to winnow seeds, carry luggage, store grain, keep fruit, etc.

The interest of the botanist is naturally aroused in the material used by the various Indian tribes in their basket-work. I have been enabled to determine a large proportion of the plants thus used in North America;* many others, of which I have no knowledge, are doubtless likewise employed, and perhaps some of the readers of GARDEN AND FOREST will kindly contribute additional information on the subject, so that the list may be made as complete as possible, even to the extent of including the material used by civilized people.

Let us begin with Grasses. In a valuable paper by Dr. O. T. Mason in the Report of the National Museum, 1884, we read that the natives of the Aleutian Islands make their mats and baskets "of the fibre of the Elymus treated as hemp," and that the marvelous nicety of this grass-weaving is worthy of all praise. The species of Elymus referred to are *E. mollis*, *E. arcnarius* and *E. Sibiricus*. The "Wild Wheat" basket-material of the Chilkah Indians may be one of these.

A *Sporobolus* is mentioned in the same paper as used by the Tule-River Indians of California, but there seems to be no species of that genus, in that locality, suitable for the purpose; it is not unlikely that *Vilfa depauperata* is meant, a plant with long, filiform and flexuose culms, much sought after by Mexicans for stuffing their large leathern aparejos, a purpose to which its toughness and elasticity specially adapt it ("Botany of California," ii., 267).

The Cane (*Arundinaria macrosperma*) of the southern states furnishes the principal material for the basket-making of the remnants of the Cherokees, Choctaws, Creeks, Chickasaws and Seminoles. The Choctaws specially excel in its use, and their little baskets, variously colored, are offered for sale in several southern cities.

The New England Indians, especially the Penobscots, make an extensive use of the Holy Grass (*Hierochloa borealis*). Its long radical leaves become strongly involute in drying, forming flexible threads, which are braided into fine strips, and these are woven into baskets and other pretty fancy work. I have also found braids of Holy Grass in a camp of the Crow Indians on the Yellowstone, but did not learn how they were used. The delicate and lasting fragrance of the dried leaves gives them an additional, and perhaps not their least, merit.

Other Grasses, species of *Spartina*, *Calamagrostis*, etc., suggest themselves as particularly suitable where length,

* My grateful acknowledgments are due Dr. C. E. Woodruff, U. S. A., for much interesting and valuable information concerning the Hoopa and Klamath Indians, whose basket-work, in variety of forms and perfection of finish, is probably not excelled in the country.

toughness and flexibility of culms are the chief requirements, but I have no knowledge of their having been used.

In a study of the subject one first thinks of Osiers or Willows as the ordinary and proper material, but it is well known that our Willows do not possess the softness and pliability which make several species of so much economic importance in Europe; even when cultivated in this country these species become woody and hard. From all the information within my reach, I am led to believe that the native Willow most used in this country, at least west of the Rocky Mountains, is *Salix sessilifolia*. From the region of the Hoopa and Klamath Indians of northern California and southern Oregon, to that of the Papagos of southern Arizona, this plant furnishes one of the best materials for the warp of basket-work. Young shoots two or three feet long are cut in the spring or early summer, stripped of their bark and dried; they are soft and remarkably flexible, sometimes quite tenuous, almost filiform. This species deserves attention as one most worthy of cultivation for the production of valuable osier. In order to keep it well pruned down and provoke new growths of young, tender shoots the Indians of northern California set fire to the woods, an operation likewise intended to improve the Hazel-nut, another highly esteemed basket-plant.

Other native species of *Salix* are, or have been, used, such as *S. cordata*, *S. sericea*, *S. petiolaris* in the eastern and middle states, the last two of real value; *S. lasiandra*, *S. lasiolepis* and *S. laevigata* in the western and Pacific states. Of the last named only the roots are used by the Hoopa and Klamath Indians.

Dr. E. Palmer states (*Amer. Nat.*, 1878) that along the Colorado River a Willow, not specified, yields an abundance of long, soft bark from which the Indians make rope, twine, sandals and mats. Willow-bark is also used by the Tule-River Indians of California.

Most species of Poplar have soft, pliable and tolerably tough rootlets well adapted to the requirements of basket-making. Those of *P. trichocarpa* are much used, entire or split, by the Indians of northern California for the brown work of the woof of their hats and baskets. Whoever has seen the petticoats, made of the inner bark of the Cottonwood (*P. Fremontii*), worn by the squaws along the Colorado River, must have realized the possibility of utilizing the same material, as well as that of the allied species, *P. monilifera*, in the manufacture of many household utensils.

The rootlets of Alder (*Alnus rhombifolia*) and probably others furnish brown threads much esteemed by the Indians of California and Oregon.

The young flexible twigs of the California Hazel-nut (*Corylus rostrata*, var. *Californica*) are almost in as great demand by the Indians of California and Oregon as the branches of *Salix sessilifolia*, these two plants making up most of the warp of their basket-work. Hazel-nut-twigs are also much used in binding fish-dams.

One of the best known basket-plants is the Trefoil Sumach or Squawberry (*Rhus aromatica*, var. *trilobata*), a shrub widely distributed from the Missouri through the Rocky Mountains to the Pacific. It is one of the chief materials of the Apaches, Navajos and other tribes in southern California, Arizona, Utah and New Mexico. The twigs are soaked in water, scraped and then split. The baskets are built up by a succession of small rolls of grass, over which the twigs are firmly and closely bound; according to Dr. E. Palmer, they "are very durable, will hold water, and are often used to cook in, hot stones being dropped in until the food is done" (*Amer. Nat.*, 1875). I am informed that the Poison Ivy of the Pacific coast (*R. diversiloba*) is also a basket-plant, but it is quite possible that this species is confounded with the preceding.

The Indian Hemp (*Apocynum cannabinum*) has a strong fibrous bast easily stripped off, and from which many tribes from the Great Lakes to the Pacific, but specially those of the Great Basin, have from time immemorial made rope, lariats fishing lines, bags, mats, baskets, belts, etc.

The Sioux Indians, I believe, never practiced the manufacture of any but the coarsest kind of basket-work, and in this the bark of the Elm (*Ulmus Americana*) takes a prominent part. The Red-Osier Dogwood (*Cornus stolonifera*), so abundant in their country, is not used in basket-work so far as I know, notwithstanding its pretty purple, osier-like shoots. It is, however, stated by B. S. Barton that the young shoots of an allied species, *C. sericea*, were formerly used to make coarse baskets.

Of vines, the California Grapevine (*Vitis Californica*) should be noted; its stems, slender, flexible and strong, make good ropes and may be twisted into various household articles. The Supple-Jack (*Berchemia volubilis*) also suggests itself in this connection.

Fort Buford, N. Dak.

V. Havard.

New or Little Known Plants.

Clematis paniculata.

THIS is a stout, vigorous plant with long, climbing, woody stems, which is widely distributed and very common in nearly all parts of Japan, and occurs also in central and northern China. It is allied to our common Virgin's Bower and to the European *Clematis Flammula*. The leaves are long-petioled and are composed of three ovate, pointed leaflets, obliquely cordate at the base, with entire margins and prominent veins. The flowers are produced in long axillary panicles; they are white, fragrant, one and a half inches across, with narrow, obovate, acute sepals. They begin to open toward the end of August and continue to appear for nearly a month, being succeeded by heads of fruits furnished with long, plumose, silvery tails which are almost as ornamental as the flowers.

*Clematis paniculata** was discovered by Thunberg, the Swedish botanist, who resided in Japan from 1773 to 1779. It is stated by Nicholson in "The Dictionary of Gardening," on what authority I do not know, as this species is not mentioned in the second edition of Aiton's "Hortus Kewensis," that it was introduced into England in 1796. Its early introduction is possible, as, according to Maximowicz, it was figured by Houttyn, a Dutch author, whose work on woody plants, to which I have not access, was published toward the end of the last century. But whether this Japanese plant was introduced early into European gardens or not, it has certainly never made any great figure in them, and I can find no portrait of it in any of the principal horticultural or botanical periods. It was included, however, in the catalogue of plants cultivated by Monsieur Lavallée in his Arboretum at Segrez, and three years ago I found it in the garden of the Paris Museum.

Clematis paniculata was probably introduced into the United States by Thomas Hogg through the Flushing nurseries, as it was received at the Arboretum thirteen years ago from Mr. Parsons. It has also been sent by the Agricultural College at Sapparo and by James Veitch & Son, of London, under the name of *C. Flammula robusta*, and by Spath, of Berlin. The credit of making this fine plant known in American gardens is due, however, to Mr. Edward O. Orpet, at one time foreman of the Hardy Plant Department in the nurseries of Woolson & Co., of Passaic, New Jersey. "When I came to Passaic," Mr. Orpet writes, "there was an old plant there which had been brought originally from Japan among other plants, and every September it was a grand sight. It did not always ripen seed, and cuttings would not root unless taken in heat in the spring. I at once thought that grafting might be tried, and as *C. Virginiana* grew wild in quantities in the neighborhood, this suggested itself to me as a substitute for *C. Vitalba*, used by the English growers as a stock for the garden varieties of *Clematis*. I tried a few; the plants took easily, were potted in six-inch pots, planted out in May, and by September had grown ten feet high, with numerous shoots which flowered right down to the ground-level.

"So much for *C. Virginiana* as a stock, but I soon found that it was hard work taking out the roots from the swamps where it grows, and as we had a number of plants of *C. Stans* in the garden I tried this, and the stock (root only) united with the cion in two weeks; and the plants made far better growth from the first. Even the large-flowered Clematises do much better when grafted on *C. Stans*, the callus being much more readily formed than when *C. Vitalba* is used. Roots the thickness of a Wheat-straw are the best, and when grafted the plants should be planted in small pots and plunged in sand in a grafting-case or a frame."

* *Clematis paniculata*, Thunberg, *Trans. Linn. Soc.*, ii., 337.—Miquel, "Prol. Fl. Jap.," 139.—Franchet & Savatier, "Enum. Pl. Jap.," i., 1.—Maximowicz, "Mél. Biol.," ix., 595.—Franchet, "Pl. David.," 12.—Forbes & Hemsley, *four. Linn. Soc.*, xxiii., 6.

C. crispa and *C. Virginica*, Thunberg, "Fl. Jap.," 239 and 240. "*C. Vitalba* e. Japonica, Houttyn, 'Houtkunde,' t. 55, f. 2."

Clematis paniculata is an ornamental plant of great value. It is vigorous and very hardy; it grows rapidly, and flowers later in the season than the other species which resemble it, and at a season when few woody plants are in flower. The fruit is very handsome and retains its beauty until winter, and its foliage turns to rich colors in late autumn. The plants sent to the Arboretum as *C. Flammula robusta* are sometimes killed back in severe winters, and are less hardy than those raised from seeds gathered at Sapparo. It is from one of these that Mr. Faxon has made the drawing which is here reproduced.

C. S. S.

SOBRALIA SANDERÆ, Rolfe, is a very handsome species introduced from Central America by Messrs. F. Sander & Co., of St. Albans. The flowers are larger than in *S. leucoxantha*, and without the orange markings in the throat, but paler and somewhat smaller than in *S. xantholeuca*. The segments are three and a half inches long and pale sulphur-white, with the throat of the lip of a bright clear yellow.—*Gardeners' Chronicle*, November 1st, p. 494.

CATTLEYA LINDENI is a beautiful form allied to *C. × Hardyana*, and probably a natural hybrid between *C. gigas* and *C. Dowiana aurea*. The sepals are pink, the petals lilac-rose with lighter veins, while the lip is very rich crimson, with two



Fig. 82.—*Clematis paniculata*.—See page 620.

New Orchids.

ANGRÆCUM HENRIQUESIANUM, Rolfe, is a very neat and pretty little species from the island of St. Thomas, West Africa, which flowered in the Botanic Garden of the University of Coimbra, Portugal, during 1889, and at Kew during the present year. It is closely allied to *A. bilobum*, but is a much smaller plant in every respect.—*Gardeners' Chronicle*, October 25th, p. 466.

CIRRHOPE TALUM MASTERSIANUM, Rolfe, is an elegant little Cirrhopetalum introduced from the Dutch Indies by Messrs. Linden, L'Horticulture Internationale, Brussels, during the present year. It is allied to *C. gamosepalum* of Griffith, a species probably not in cultivation. The flowers are buff, variously marked with reddish brown, and with a purple-brown lip. It is described and figured in *Lindenia*, vol. vi., p. 33, t. 245.

lateral yellow blotches in the throat. It was exhibited by Messrs Linden, L'Horticulture Internationale, Brussels, at a meeting of the Royal Horticultural Society on October 28th last, when it received an award of merit.—*Gardeners' Chronicle*, November 1st, pp. 507, 508.

MASDEVALLIA O'BRIENIANA, Rolfe, is a tiny little species about two or three inches high, which appeared in the collection of Mr. R. I. Measures, of Camberwell. It is closely allied to *Masdevallia simula*, but has much larger flowers, which measure half an inch in length. The flowers are light yellow, spotted with maroon, and very pretty.—*Gardeners' Chronicle*, November 8th, p. 524.

ONCIDIUM LEOPOLDIANUM, Rolfe, is a noble and handsome Oncidium, introduced by Messrs. Linden, L'Horticulture Internationale, Brussels. It belongs to the Cyrtorchilum section, and is allied to *O. corynephorum*, Lindl. The peduncle is said to

attain a height of several metres, and to bear as many as 300 flowers, which are white, with a purple disc to the sepals and petals, and a violet-purple lip. It is dedicated to His Majesty, Leopold II., King of the Belgians.—*Gardeners' Chronicle*, November 15th, p. 556.

CATTLEYA O'BRIENIANA.—A plant of this was exhibited at a meeting of the Royal Horticultural Society on November 11th last by Messrs. F. Sander & Co., of St. Albans. It is said to have light purple sepals and petals and a lip with crimson splashing. From a flower which I have seen I suspect it to be a pale form of *C. Harrisoniae*.—*Gardeners' Chronicle*, November 15th, p. 556.

ODONTOGLOSSUM DAVIVIERIANUM, Rchb. f.—A supposed natural hybrid between *O. maculatum* and *O. nebulosum*. It was exhibited by Messrs. Linden, L'Horticulture Internationale, Brussels, at a meeting of the Royal Horticultural Society on November 11th last, when it received an award of merit.—*Gardeners' Chronicle*, November 15th, p. 570, and 22d, p. 602.

ODONTOGLOSSUM NOEZLIANUM.—"A dwarf, delicate-growing novelty, with small, circular, bright scarlet flowers." It was exhibited by Messrs. Linden, L'Horticulture Internationale, Brussels, at a meeting of the Royal Horticultural Society on November 11th last, when it was awarded a botanical certificate. I have not seen it.—*Gardeners' Chronicle*, November 15th, p. 570, and 22d, p. 602.

SOPHRO-CATTLEYA X *CALYPSO*, Rolfe, is a beautiful hybrid raised by Mr. Seden for Messrs. James Veitch & Sons, of Chelsea, from *Sophronitis grandiflora*, fertilized with the pollen of *Cattleya Loddigesii*, var. *Harrisoniae*. The sepals and petals are of a brilliant rose-purple, much like those of the *Sophronitis* in shape, while the lip, which much resembles the pollen parent in shape, is light yellow, passing into pink on the margin of the side lobes, and into deep yellow on the base of the front lobe, the apical half of which is crimson-purple.—*Gardeners' Chronicle*, November 22d, p. 588.

Kew.

R. A. Rolfe.

Cultural Department.

A Winter Lettuce Crop.

THE accompanying illustration, taken from a photograph, shows a section of a crop of Lettuce which is now (December 8th) maturing in the forcing-houses of the Cornell Experiment Station. It was grown primarily to be used for one of a series of experiments to determine the influence of the electric light upon various plants. Owing to a delay in establishing the light, no study of this kind will be made until the succeeding crop, but it still serves admirably to illustrate a successful method of culture.

The crop is a remarkably even one, not a single plant being missing from the bed, which is sixty feet long. There are two varieties shown in the picture, the plants upon the right half being the Tennis Ball or Boston Market, and those upon the left Landreth's Forcing Lettuce. In this crop the latter variety has surpassed even the old and popular Tennis Ball, while growing side by side with it and under precisely the same conditions, the heads being somewhat darker in color, and uniformly larger and heavier.

The seed was sown about the 1st of October in shallow seed-boxes or "flats," and transplanted two weeks later ten by twelve inches apart into the soil upon the benches. As with other forcing crops, the arrangement of the beds is a matter of considerable importance. In this house, constructed for various experiment purposes, the steam pipes are beneath the benches, an arrangement which is not essential for a Lettuce-crop, and in order to moderate the bottom heat the benches were double-boarded. To provide for drainage a layer of clinkers from the ash-pit was first placed over the boarding about an inch in depth. This was succeeded by three inches of roughly broken compost, consisting of two-thirds partially decayed sods and one-third stable manure, the whole being then covered by three inches of mellow garden soil, thus making a total depth of seven or eight inches upon the benches. With such a body of soil the conditions as regards moisture may be made approximately the same as those of out-door culture. If the soil is much shallower than this, it is constantly liable to become dried out as well as too warm, with a consequent check to the growth of the plants.

In forcing Lettuce it must be borne in mind that it is a comparatively hardy plant, which thrives best in a temperature which would be far too low for most of our forcing crops. In this case the effort has been to maintain a temperature at night of fifty degrees, and by day of ten to fifteen degrees higher. Of the two chief hindrances in the forcing of Lettuce, mildew and the aphid, the former has not made its appearance, and the

latter has been held in check by frequently burning tobacco-stems, lately as often as two or three times a week.

About two weeks before the maturing of the crop provision was made for a succeeding crop by again sowing seed in the flats, and as soon as the beds are cleared the space will be at once filled by the seedlings now growing for that purpose. When every day's growth of a crop is made at the expense of burning many pounds of coal, it is manifestly of the highest importance that the crop should be pushed to maturity as rapidly as possible and the strictest economy of time and space be studied in providing for their succession.

Cornell University.

C. W. Mathews.

Begonias.

THE cultivation of Begonias would seem to be a trite subject, but one finds among friends but limited collections of these desirable plants, and perhaps a few notes of interesting varieties may prove helpful to novices. There are said to be over 300 species of Begonias, and, of course, hybrids innumerable. With their widely divergent forms and habits, they are of great interest, and one could busy himself at all seasons collecting and cultivating this genus alone. Few plants of such easy culture are so satisfactory in bloom and so readily grown into specimens, and there is a constant change of interest as the various sections come into season. During the winter the greenhouse may be kept gay with handsome foliage and graceful flowers of many herbaceous kinds, of *B. Socotrana* and of hybrids of the tuberous section. In early spring the various tuberous species and hybrids will commence to move and make ready to replace the winter bloomers, which may be plunged in the borders to regain vigorous health. One pleasing point about most herbaceous kinds, which small growers will appreciate, is that such plants as one may have no room to cultivate may be kept nearly dormant at any time by cutting them down and keeping them nearly dry and pot-bound. For the greenhouse and conservatory decoration, fancy-leaved kinds will be found desirable, a few of the Rex varieties possibly, and those of distinct and striking form and leaf structure. Perhaps the most useful of fancy-leaved Begonias is the well known *B. metallica*, as this not only forms a handsome plant, but furnishes a larger supply of foliage suitable for cutting than perhaps any other variety. Clementina, a hybrid between a form of *B. Rex* and *Diadema*, is an excellent new variety, with characteristics of both parents, a handsome and vigorous grower. *Diadema* and *Sceptrum* are two attractive varieties, with rather palmate-like, deeply cut leaves and silver markings.

B. Verschaffeltii, *B. ricinifolia maculata* and *B. Sunderbruchii* are three forms with large, deeply cut leaves on long foot-stalks, which are distinct and effective for decoration. They bloom in summer. *B. rubella* is also a distinct and desirable kind of similar habits. Its large, bronzy red leaves are thickly dotted with black spots.

B. Scharffiana, a new species, is a beautiful plant with large massive leaves on thick, fleshy red stems. The leaves are bright emerald green on the upper and deep red on the under side. The whole plant is covered profusely with short hairs. One feature of this plant is the refined beauty of the young leaves as they push out from the delicate greenish white scapes in which they are first enveloped. My plants, though large and nearly two feet high, have not yet bloomed. They are said to have good-sized white flowers, but these can scarcely add to the ornamental character of this species. Of varieties with fine flowers and handsome foliage *Gloire de Sceaux* may have first mention—a vigorous variety with leaves of polished bronze and large racemes of rose colored flowers. *Gloire de Jony* and *Madame Hardy* are two fine hybrids of *B. subpeltata*, with large pink flowers and beautiful foliage, the former light olive green and with a metallic sheen dotted with silver, the latter dark wine colored, checkered and covered with a crimson pile. *B. Olbia* is a species which is indispensable, though the beautiful crystalline flowers are axillary and not prominent. Its delicate, finely veined leaves are deeply cut, a dull red beneath, and of an indescribable combination of metallic bronzy green and red above. The entire effect of this plant with its beautiful foliage and its white, thick, tapering stems is very distinct and pleasing.

Of the varieties chiefly valuable for their flowers, though more or less ornamental, perhaps the first place should be given to *B. Socotrana*, which is proving such a valuable plant to the hybridizer. This variety starts into growth in September from bulblets formed at the base of the old plant. Its leaves are deep green, round, depressed in the centre and recurved at the margin; the flowers are bright rose, one and a half to two inches across, and last for a long time. From this species we

now have a few winter-blooming tuberous kinds with showy flowers. John Heal and Adonis are the best known of these. The former is said not to be a good grower. Triomphe de Lemoine is a hybrid from *B. Socotrana* and is a vigorous variety. This has already been figured in GARDEN AND FOREST. *B. Socotrana* has also given a hybrid with *B. insignis* named Bijou, which I find is a satisfactory kind with twiggy stems, prostrate habit and bright magenta flowers. *B. incarnata* is an established favorite among the winter-flowering kinds, and the French have given us a few varieties of this varying in color of flowers. Of these M. Crousse, M. Choner, M. Ed. Pynaert and M. Vallerand are the best.

The Semperflorens type are perhaps the most useful Begonias for flowers, being, as implied by name, very free bloomers. The varieties of this are very numerous, and the flowers range in color from white, through pink to deepest carmine. Some of the most useful varieties are Elegans, Bruanti, Lucianæ and Bajocensis.

A strain with more vigorous, taller habit and larger leaves is *B. semperflorens gigantea*, very useful for back rows and producing large racemes of fair sized flowers. The best of these are Odorata (Dr. Nachtigal), Amelia, Rosea and Carminea.

that a wider distribution of some of the kinds noted above would increase the interest of many growers whose attention had not been called to them.

Elizabeth, N. J.

J. N. Gerard.

Filmy Ferns.

THE exceptional interest and charm of the Filmy Ferns, both as objects of study and as ornamental plants, is generally recognized. Botanically they have always received considerable attention on account of their special structure, which differs so markedly from that of the rest of the Ferns that some authors have separated them into a sub-order. Their vegetative peculiarities are being specially studied by more than one botanist in England at the present time. Horticulturists are attracted to them by the elegance and delicacy of their fronds, and their cultivation is a special hobby with several amateurs, while a few of the species, such as *Todea superba* and the Killarney Fern (*Trichomanes radicans*), are grown among Ferns generally. There are, however, a considerable number of beautiful species, known to and cultivated by a few specialists, which are quite as easy to manage as those already named, and, in fact, may be grown under precisely similar conditions



Lettuce in a Forcing-house.—See page 622.

Among the more striking of newer Begonias Paul Bruant is probably the best. A vigorous variety, with deep cut light olive leaves, with toothed edges and bearing a great profusion of light rose flowers in racemes. M. de Lesseps is in the way of *Argentea guttata* with larger, darker leaves. Of older varieties, Mr. Barker has already called attention in GARDEN AND FOREST to *B. manicata* and *B. manicata aurea* (the variegated variety), very useful kinds, which in mid-winter fairly burst into blossom with numerous racemes of small pink flowers. *B. Gibsoni*, of course, must be noted as quite indispensable with its rosy blooms partly doubled, and among a host of older favorites are *Compta*, with pink stems, satiny green leaves and a silvery tinge along the mid-rib; *Decora*, with dark green silver-marked leaves; *Argentea guttata*, which some one has called Angels' Wings; and its wing-like silver dotted leaves bear out the name very well. But space forbids even naming many established favorites whose various charms and strange forms make these plants so interesting. Among the varieties one may find kinds simulating in foliage other plants of widely divergent habits, and even an annual species, *B. Schmidtii*, self-sown seedlings of which are continually appearing in all available spaces. Their habits are nearly as diverse as their foliage. Among them are dwarfs and giants, plants stiffly upright and scandent, and all intermediate forms with strongly marked periods of growth and rest in many cases.

Every one who cultivates flowers has a few much appreciated Begonias and they are no novelties; but it would seem

with the Killarney Fern and the New Zealand Todeas. It is probable that many have avoided Filmy Ferns from a belief that they could only be grown where conditions of a very special character were provided. This belief is supported by the miserable health of Filmy Ferns in many gardens where their cultivation is attempted. Failure in these cases is, as a rule, obviously the result of ignorance of two very simple, but vital, factors in the healthy growth of these plants—namely, moisture and ample drainage. Filmy Ferns detest lime; they should, therefore, be watered with rain-water. As a rule, they dislike watering overhead, although the atmosphere about them should be kept constantly saturated. They will not thrive if planted in heavy or close soil. Peat fibre and pieces of soft sandstone, or even a bare piece of sandstone alone, or a piece of soft Fern-stem, afford the most suitable material for their roots and creeping rhizomes to cling to. If they are to be grown in pots and covered with bell-glasses, then the whole of the pot should be filled with drainage, upon which a little mound may be built with peat-fibre and sandstone. The plants should then be fastened onto this by means of wooden, not wire, pegs. To water plants thus treated, dipping the pot up to the rim in water or pouring water over the bell-glass so that it will run down into the pot, answers very well. If a frame can be afforded for Filmy Ferns alone the preparation in regard to drainage and soil should be similar to that recommended for pots. The surface of the soil may be varied by raising some parts higher than others by the free use of sand-

stone. In watering the frame do not use a rose-nozzle, but pour the water from the spout of the can onto the stones or anywhere except on the leaves of the Ferns.

All Filmy Ferns require a subdued light at all times of the year. In a state of nature they are found only in very sheltered spots, often clothing the under surface of stones or fallen tree-trunks, always in positions protected from wind and the drying influence of sunshine. If the sun is allowed to shine direct upon them only for an hour or so in summer they become dried and shriveled beyond recovery. Some of the species, particularly *Todeas*, may be grown in positions where they would get a moderate amount of sunshine, but fine specimens cannot be produced by its means.

The temperature most congenial to Filmy Ferns when under cultivation has only recently been arrived at. A few years ago the general belief with regard to all Filmy Ferns except the *Todeas*, the Killarney Fern and New Zealand species was that they required a tropical temperature. The discovery that this was an error was purely accidental. The late Dr. Cooper Forster, who had grown a large collection of Filmy Ferns in a conservatory attached to his surgery in Grosvenor Street, related how, on his heating apparatus breaking down, he was forced to leave his plants to their fate. Instead of dying from the reduced temperature, as he expected, the majority of them displayed a vigor of growth and depth of color which told their own story unmistakably. Even pteridologists were incredulous of this story until they saw its proof in the health of the collection of plants in Grosvenor Street. It was plain enough that many of the species which hailed from distinctly tropical regions were much happier when under cultivation in England if the temperature for them was kept comparatively low. At the time of Dr. Cooper Forster's discovery the Kew collection was grown in a temperature which in winter never sank below sixty degrees nor in summer below seventy degrees. With the exception of a few species, which were either too precious to risk in an experiment or were perfectly happy in a stove temperature, the whole collection was removed to a cool fernery in 1885. In this house no fire heat is used except during winter, in frosty weather the thermometer often registering fifty degrees or even forty-five degrees. With scarcely an exception the whole of the plants have proved not only able to support this low temperature, but the growth has been uniformly better than it was when they were in a warmer place. Many of them are from tropical regions where it is scarcely likely that they would ever experience a temperature anything like as low as they enjoy when under artificial cultivation. The following list comprises all the species which thrive in the cool fernery at Kew:

<i>Hymenophyllum æruginosum.</i>	<i>Trichomanes alatum.</i>
" <i>asplenoides.</i>	" <i>var. attenuatum.</i>
" <i>axillare.</i>	" <i>apiculatum.</i>
" <i>caudiculatum.</i>	" <i>auriculatum.</i>
" <i>chilense.</i>	" <i>Colensoi.</i>
" <i>ciliatum.</i>	" <i>crinitum.</i>
" <i>cruentum.</i>	" <i>depauperatum.</i>
" <i>demissum.</i>	" <i>digitatum.</i>
" <i>var. minus.</i>	" <i>exsectum.</i>
" <i>var. nitens.</i>	" <i>Filicula.</i>
" <i>dichotomum.</i>	" <i>feniculaceum.</i>
" <i>dilatatum.</i>	" <i>humile.</i>
" <i>flabellatum.</i>	" <i>lucens.</i>
" <i>Fosterianum.</i>	" <i>maximum.</i>
" <i>fuciforme.</i>	" <i>membranaceum.</i>
" <i>hirsutum.</i>	" <i>parvulum.</i>
" <i>Javanicum.</i>	" <i>pusillum.</i>
" <i>var. cristatum.</i>	" <i>pyxidiferum.</i>
" <i>var. flexuosum.</i>	" <i>var. olivaceum.</i>
" <i>lineare.</i>	" <i>radicans.</i>
" <i>Lyallii.</i>	" <i>var. Andrewsii.</i>
" <i>multifidum.</i>	" <i>var. Boschianum.</i>
" <i>obtusatum.</i>	" <i>var. concinnum.</i>
" <i>pectinatum.</i>	" <i>var. dilatatum.</i>
" <i>var. superbum.</i>	" <i>var. dissectum.</i>
" <i>polyanthos.</i>	" <i>var. Luschnati-</i>
" <i>pulcherrimum.</i>	<i>anum prolongum.</i>
" <i>rarum.</i>	<i>Trichomanes radicans, var. Lusch-</i>
" <i>scabrum.</i>	<i>natianum pulchrum.</i>
" <i>sericeum.</i>	<i>Trichomanes radicans, var. Lusch-</i>
" <i>tamaricifolium.</i>	<i>natianum superbum.</i>
" <i>Tumbridgense.</i>	<i>Trichomanes reniforme.</i>
" <i>var. Wilsoni.</i>	" <i>rigidum.</i>
" <i>valvatum.</i>	" <i>var. elongatum.</i>
<i>Todea Fraseri.</i>	" <i>sinuosum.</i>
" <i>var. Wilkesiana.</i>	" <i>strictum.</i>
" <i>grandipinnula.</i>	" <i>tenerum.</i>
" <i>hymenophylloides.</i>	" <i>trichodeum.</i>
" <i>plumosa.</i>	" <i>venosum.</i>
" <i>superba.</i>	

W. Watson.

Ruellia macrantha is certainly one of the most ornamental of the many cultivated winter flowering Acanthads, but it is scarcely known in gardens. It is a native of Brazil, from whence it was introduced by Van Houtte in 1875 and figured in the *Revue Horticole* the year following. It forms a compact many stemmed shrub from a foot to two feet in height, with oblong-lanceolate bright green leaves six inches long. The flowers are produced singly in the axils of the upper leaves, and as many as six flowers are opened together on each shoot. The calyx is formed of five linear segments an inch long, and is subtended by a pair of oblong green bracts also an inch in length. The corolla at the base is in the form of a narrow tube about an inch long, then broadly campanulate with five ovate spreading segments. The length of the whole flower is three inches and it measures three inches across the top. The color is a rich purplish rose, very similar to that of *Bougainvillea spectabilis*. The flowers last at least a week when cut and placed in water. The plant is easily propagated by means of cuttings, and it grows freely in an ordinary stove. Other species of *Ruellia* which are useful as winter-flowering plants are *R. Herbstii*, with terminal clusters of tubular flowers colored magenta and lilac; *R. macrophylla*, with brilliant scarlet *Salvia*-like flowers; *R. affinis*, with an erect semi-scandent habit, large, dark green leaves and terminal clusters of salmon red flowers almost as large as those of *R. macrantha*. These plants formerly belonged to the genus *Dipteracanthus*, now merged in *Ruellia*. *R. macrantha* can be recommended as an exceptionally good stove-flowering plant.

Iris stylosa is a useful plant as a source of cut flowers in early winter. It is generally considered a shy bloomer, but when planted close against the south wall of a greenhouse it blooms profusely from October into December. At any rate, some plants obtained last year from a French nurseryman and planted in the same border with the *Jacobæa Lily* (*Sprekelia*) have been flowering freely since October, and are bearing good flowers now, notwithstanding the severe frost and snow of the past fortnight. *I. stylosa* is a native of Algeria, where it is common in the hedges. It has a creeping rhizome, evergreen narrow leaves, one and a half feet long; scapes about a foot long, one-flowered; each flower is nearly three inches across and colored a rich purple-blue, with a few lines of yellow on the falls. It has been in cultivation over twenty years. There are several named varieties of it, one with white flowers. It is described as a spring-flowering species.

Kew.

B.

Clematis Stans.—This plant when in growth and covered with foliage would appear to belong to the same section as *C. Davidiana* and *C. tubulosa*, and has in fact been described as a white *C. Davidiana*. All three of the above plants resemble each other in having leaves like the Japan Anemones, but the likeness ends here. *C. tubulosa* has deep blue flowers, and *C. Davidiana* light lavender blue, both being hardy herbaceous plants, while *C. Stans* has white flowers and is a hardy shrub. This statement is made because *C. Stans* is often called a hardy perennial, which it is, but not a herbaceous perennial, as many are led to suppose. The plant grows three or four feet high, the main stems being woody, and they bear close resemblance to the wood of a Grapevine, being of the same color and thickness, while the leaves are always opposite, with plump buds at their base. The propagation of this *Clematis* is easily effected by means of the hard wood and the axillary buds. The shoots may be cut up into single eyes, as is done with the Grapevine, and when placed in sand in a propagating bench they will make callus and grow readily. Apart from the beauty of this plant, *C. Stans* is the best species from which to obtain roots upon which to graft other species of *Clematis*. It is well known that *Clematis* come slowly from seed, and consequently grafting is resorted to as a much quicker method of reproduction. We have tried the roots of several species, but none united so readily with the cion as those of *C. Stans*. The union was perfect in two weeks, and the ligature could be removed with perfect safety. This species has therefore a peculiar value not only as a decorative plant, and on account of the ease with which it may be increased, but because it is such a help in multiplying other species and varieties which without such a convenient stock increase but slowly.

South Lancaster, Mass.

E. O. Orpet.

Dianthus plumarius semperflorens.—With regard to the origin of this plant, to which allusion has already been made on page 562 of this volume, Mr. Thompson, of Ipswich, England, writes that M. Alphonse Alégatière, of Lyons, France, obtained it by crossing the best forms of the florists' Pink (*D. plumarius*) with a Perpetual Carnation. He adds that the first lot of seed he obtained and distributed was the only one of any value,

subsequent supplies turning out to be ordinary Carnations of no value whatever. It will, perhaps, be remembered that Monsieur Aléatière was the originator of that excellent class of Tree or Perpetual Carnations, well represented by such varieties as A. Aléatière, Cardinal, Miss Joliffe and Souvenir de la Malmaison, which was so much improved by the late Mr. Charles Turner, of Slough, England.

Cambridge, Mass.

M. B.

The Forest.

Value of Mountain Forests.—II.

ANOTHER important function of mountain forests is the production and maintenance of such conditions of the soil, water, atmosphere and scenery of the region as are highly favorable to human life, health and enjoyment. An evergreen mountain forest like that of our White Mountain region is a great natural sanitarium, one of the best and most effective in the world in its life-giving and health-restoring qualities. The destruction of forest-conditions over this region would distinctly shorten the lives of great numbers of persons. It would be a serious error to conclude that the sanitary influences of these mountain forests are important only or chiefly to persons already affected by disease. The millions of dwellers in cities all need a season of out-of-door rest and recreation in summer in order to maintain the physical and mental health and soundness which are essential to success in the work of life. Our New Hampshire mountain forest-region is a summer playground for the inhabitants of Boston, New York, Philadelphia and the great cities of the south and west. As their population increases our entire area of forests, lakes and streams will be needed for this purpose, and it will soon all be brought into use if its attractiveness is not destroyed by despoiling the woods and waters of their freshness and beauty. For the weariness and exhaustion of vitality which so often result from excessive activity in the crowded life of towns and cities there is no healing influence more effective than the silent unconcern of Nature amid the scenes and conditions of summer residence in a mountain forest-region.

FISH AND GAME PRESERVES.

As a part of this sanitary function of mountain forests, their value as natural preserves for fish and game deserves far more serious and intelligent attention than it generally receives. Some occupation is necessary for many persons who go to the woods for summer rest and recreation, and the pursuit of game and fish supplies both physical and mental conditions which are highly favorable and restorative. The slaughter of game of any kind for the mere sake of killing, and of delight in the quantity butchered, is not only unsportsmanlike; it is coarse and disgraceful, and should receive pronounced disapproval everywhere. But fishing and hunting, as pursued by civilized and orderly anglers and hunters, are legitimate and proper means of recreation. If the forests are destroyed there will soon be neither fish nor game. When the shaded brooks are opened to the sun the trout will disappear, and when the wilds are despoiled of their sylvan beauty and sheltered solitudes the hunter's delight in them will be at an end.

The value of mountain forests on account of the beauty and charm of their scenery is closely allied to the sanitary influences already mentioned, and beauty of scenery—in addition to its power to produce happiness, to awaken and nourish "vital feelings of delight," and because of this power—beauty of scenery has in modern times great economic value. Switzerland and Norway and other mountainous countries in Europe derive important revenues from their scenery, which attracts multitudes of visitors from all parts of the civilized world. New Hampshire is remarkable for having so much attractive scenery, so many beautiful landscapes distinct from each other, within a comparatively small area of country. In this respect it is unequaled in any part of the United States. Several millions of dollars are brought to the hands of our people every year by summer tourists and boarders, and yet the attractions of our mountain region are by no means fully developed. But these valuable revenues will be diverted to other parts of our country, and to Europe, unless our mountain forests and streams are protected and preserved.

THE UPPER COÖS COUNTRY.

The fertile valley land of the upper Connecticut River is now at its best. The hills on each side were, until a few years ago, heavily covered with valuable timber. Now they have all been lumbered over. This would not of itself do any harm. Timber should always be cut when it reaches its best condition. That is what it is for. But at many points in this Upper

Coös country the steep slopes rising from the valley on each side have been burned over till the root-mat which held the soil in place is breaking up. The young people of our day are likely to live to see this rich upper Connecticut valley almost completely destroyed. The surface materials of the hills will be carried down more and more by the action of the water in the spring season, and will bury the soil of the valley under deposits of inert substances. There are already places on these slopes where trees will never grow again.

Both Connecticut Lake and Second Lake were formerly surrounded by woods, and the trees grew to the very edge of the water. In order to land, when rowing, a man had to push his boat up among the boughs of the trees and climb out on them, unless there was a landing cleared by the axe. The blue sky never bent over anything in Nature more beautiful than these mountain lakes of crystal clearness, with their miles of shoreline one continuous fringe and wall of green foliage. But Connecticut Lake has been dammed to raise the water to float logs. The back-water has killed the timber, and now all the lower portions of the shores are ghastly and repulsive tracts where the decaying tree-trunks are gradually dropping into the polluted water below. This destruction of the timber by the back-water was entirely unnecessary.

All the country around Connecticut Lake and Second Lake and between the two, and part of the way from Second to Third Lake, has been lumbered over. The timber is not all removed, and from a distance the forest still looks green, but in the woods the tangled mass of fallen trees and tree-tops is almost impassable.

The wilderness around Third Lake has not yet been disturbed. This lovely sheet of water is in the heart of a primeval and not easily penetrable forest, and the traveler is here companioned by the sources of the Connecticut River. The lake extends within a mile or so of the Canadian line. In the upper Connecticut valley men feel as if the world had just been made and given to them. They say, "Why, there's hardly anything *but* woods! We haven't begun on them yet." It seems to them as if the forests around them were inexhaustible, but the price of timber lands is advancing in every part of our country because business men have become aware that the White Pine supply of the upper Mississippi Valley is speedily coming to an end, and that everywhere our consumption of timber greatly exceeds the rate of growth. People are unwilling to think of the future, to recognize the conditions which will surround their children. Yet without such foresight the permanence of what we value most in our civilization is impossible.—From the Report of J. B. Harrison, Commissioner of Forests for New Hampshire.

Correspondence.

The English Sparrow.

To the Editor of GARDEN AND FOREST:

Sir.—I have read lately in the Journal of the French Société d'Acclimatation an account of the damage done in the United States by the English sparrow. It was a most unfortunate idea introducing into America these birds, always more destructive than useful, without introducing, too, their natural enemy, created, apparently, expressly to check their excessive multiplication. This enemy of the European sparrow, which it certainly would not be difficult to naturalize in the United States, is the pigmy owl known in France under the name of Chevéche, the *Stryx passerina* of Linnæus. He is a ferocious and well-armed bird, able from his small size to enter into small holes in walls or rotten trees, or wherever the sparrows make their nests. Although the Chevéche attacks rats and mice like the other species of Stryx, his specialty as a carnivorous bird is to destroy sparrows. He is not larger than a blackbird, although shorter and stouter. The short, strongly-armed claws of this bird permit him to climb up the face of a wall and to ascend and descend the cavities of old trees, into which he plunges without hesitation. This little bird inhabits, too, churches and all sorts of old buildings, and, in a word, all the out-of-the-way places which the other birds of the same genus seek. He is only partly nocturnal, beginning to hunt his prey at dusk. The Chevéche not only exterminates the sparrows' nests, but it drives them away entirely by its presence alone from any locality. Sparrows so fear this bird that whole flocks of them depart as soon as they notice that it is established in any particular region. This little owl to the sparrow is like the presence of a wolf in a sheep-fold.

It seems to me, therefore, that it would be an interesting experiment to try to naturalize this bird in America. In order to make the attempt successful, and this is true in all efforts to naturalize birds, there are certain conditions which must be

fulfilled; the most important is to procure for the strangers houses and retreats where they can find shelter and can rear their young in safety. Numerous laws have been adopted in France for the protection of insectivorous birds, although none of them have yet produced any very satisfactory results. And this must always be the case as long as people cannot be made to understand that birds need places of refuge in which to build their nests and breed without fear of being disturbed by man, or by dogs, cats and other destructive animals.

The stupid destruction of nocturnal carnivorous animals, like owls, bats, etc., is one of the great agricultural errors of our time, and it is safe to say that the enormous losses in crops due to rats, mice and various insects are largely in consequence of this error. Rabbits in Australia are ruining crops, and still they might be got rid of by introducing the great owl (*Stryx bubo*), the special enemy of rabbits, and other large carnivorous animals like eagles, which are not rare in the south of France. It is certainly astonishing in this era of progress that the world does not know better how to make use of such assistance as nature offers us free of charge.

Villa Thuret, Antibes.

Charles Naudin.

Why Private Grounds Should be Enclosed.

To the Editor of GARDEN AND FOREST:

Sir.—The article on "Private Grounds in Cities and Towns" in your issue of December 10th prompts me to make a plea for enclosures, for the appearance of privacy in the grounds about a house, as the matter is in my mind every day as I look about my own neighborhood. I am glad that Mr. Baxter admits the "great charm in a 'close,'" but I regret that he treats it as almost an impossibility in this age and country, and wholly at variance with our habits and character, something to be relinquished with a sigh rather than to be sought and striven for.

I know nothing of landscape-gardening, and speak merely as a suburban dweller, accustomed to see his own small grounds and those of his friends from within and to look on the property of others from without, and to feel that from whichever point the usual surroundings of an American suburban house are looked at, their attraction depends chiefly on the extent to which they give an impression of privacy. It is true that a low, open fence of rails or palings gives little privacy, and, unless covered with vines, may be unsightly; but thick, high, graceful hedges, while grown less easily than in Europe, are possible with care, and should by all means be encouraged. A private lawn, be it large or small, with nothing to separate it from the public street, looks, to me, undressed and undignified.

Why is not the desire for privacy thoroughly healthy and sensible? So long as a man surrounds his property with nothing unsightly, his duty to the public is done. He cannot be called upon to share his grounds with them. We attach a great deal of importance to the idea of home, priding ourselves upon the home-loving spirit as something peculiar to our race. Who could take pleasure in a home with no front walls to the rooms, or with those walls of glass so that every passer-by could see all that was going on?—and yet why should the house alone be home, why should not the home idea include the grass and trees and flowers about a house?

Then, too, barriers, as was said in GARDEN AND FOREST last year (vol. ii., p. 193), give "the element of mystery, of surprise and expectancy, the impression and promise of something still before us and beyond what we can see, which may minister a fresh delight." Why should the public be refused the pleasures of imagination as to what may lie behind the hedge, and be given only the cold, hard facts of a small grass plat and a few regulation dwarf trees and stiff flower-beds?

I believe that the first step of most village improvement societies is to seek to remove whatever separates private grounds from the street. By this they cut at the root of that public spirit and that love of the picturesque which they seek to gratify and develop. No man will care much to make the village attractive who does not care to make his own grounds so; and how much is he likely to care about them when he regards them not as part of his own home, but merely as an adjunct to the street? Again, the desire to see into a neighbor's grounds, to enjoy his property without cost, regardless of how much his own use of it may be abridged thereby, is the very opposite of public spirit. These societies may do well to attack unsightly fences; but they should recommend something better in their place, and remember that the love of due privacy is not to be condemned, for it is generally found closely allied to the love of the beautiful and the love of nature.

Mount Airy, Philadelphia.

Charles C. Binney.

Autumn Colors in Oregon.

To the Editor of GARDEN AND FOREST:

Sir.—In a contribution to GARDEN AND FOREST last year concerning the autumnal coloring of this region I failed to mention one of the most interesting plants of our western flora, the Azalea of the Pacific coast, *Rhododendron occidentale*, known here almost universally as the "Honeysuckle." This popular name has descended to it, doubtless, from its eastern cousins, *R. viscosum* and *R. nudiflorum*, which are commonly called by this name. It is a handsome shrub, quite abundant in many wooded districts. In others it is seen only now and then near the borders of streams, or sometimes forming handsome clumps in some neglected corner of the field. But, wherever seen, in the fall of the year its leaves glow with such a profusion of scarlet and crimson mingled with the gold and green, that it produces the most delightful effects, which are none the less pleasing, it seems to me, than those it produces when in full flower.

Prunus subcordata, the wild Plum of this region, should also have been mentioned. The wild Plum sometimes becomes a small tree, but is seen generally as a small shrub three to four or five feet in height. It often sets the whole countryside ablaze in the autumn with the abundance of its scarlet and crimson colors, mingled, of course, with red and yellow, and garnished with a sprinkling of green.

Just at this time (November 27th), however, most of our deciduous trees and shrubs are stripped of their foliage, only a few of the Cottonwoods and Alders, and sometimes the sprouts about the base of a felled Oak, still holding a portion of their leaves. But the Willows have been conspicuous for the past week or two by the bright yellow of their leaves. These flame out into the brightest of yellow colors just as the deeper and richer scarlets and crimsons and reds are about dying out. The Willows here rarely form trees, but grow mostly in great clusters of slender, wand-like stems, the younger sprouts being very handsome in the winter with the polished green and red of their bark.

But in the cultivated orchards many of the Pear, Peach and Apple-trees still hold their leaves. The Prunes and Plums and Cherries, however, are bare. I notice that the Periwinkle (*Vinca*), which our people here almost universally call "Myrtle," and a few other garden plants, are yet in bloom, with expanding flower-buds on late blooming Roses.

Wimer, Ore.

E. W. Hammond.

Planting a Screen.

To the Editor of GARDEN AND FOREST:

Sir.—I have been wishing to plant as a screen and for variety some Staghorn and Glabrous Sumachs, and have hunted for suggestions as to the best method of transplanting to secure the best and speediest results. In early November I selected the best specimens I could find on the road-side and put them in rather poor and shallow soil. The specimens I selected were as tall as any I remember to have seen, the Staghorn certainly eight feet high, the other, I should think, four to five feet high. Then I had a thick mulch of coarse manure applied, and in December I contemplate cutting them down about one-third. Can you suggest any treatment better than this?

Wm. A. Jenner.

[The mulching and cutting back are good treatment. Perhaps smaller plants would have been preferable.—Ed.]

Sporting of Chrysanthemums.

To the Editor of GARDEN AND FOREST:

Sir.—The variable coloring of Chrysanthemums forms an interesting subject for speculation and research, and can hardly be studied too minutely. At least one or two features of this tendency to sport I have not seen mentioned in print. Several years ago I bought a single plant of Fair Maid of Guernsey, a white variety with almost globe-shaped flowers and finely quilled petals. Next season I raised several plants from the original one, and was surprised to notice that while some of them flowered after the fashion of the old stock, others produced a flat flower, with petals as broad and open as Elaine or Puritan. At that time I had but the single variety, and there were no other Chrysanthemum cultivators in the vicinity. The sporting apparently all occurred in one season, and the variation appears to remain true, though of that I cannot speak positively. The original plant from which all the others came is still in existence and has not changed its appearance. I have now marked several specimens of both forms and shall watch them carefully.

Two plants of the flat petaled form were left outside this fall till late in November, and both developed a rich purplish tinge on the lower side of the outer petals that was quite striking. From this fact and from the fact that Duchess, one of the most variable in coloring, is usually almost white when subjected to undue cold, it would appear that the state of the atmosphere has much to do with sporting. Duchess is also easily affected by poor light, becoming faint yellow instead of its usual "Zinnia red" color. It will doubtless be found that heat and light are together accountable for about all there is of the change of color in Chrysanthemums. But this does not explain the opening out of the petals of the Fair Maid of Guernsey.

Buffalo, N. Y.

J. C.

Recent Publications.

The Forests of North America.—III.

Die Waldungen von Nordamerika ihre Holzarten, etc.

In the previous notices of this work (pp. 193, 200) special attention was given to that part of Dr. Mayr's work relating to the distribution of forests and the species of trees of which they are composed. There now remains another portion of the work to notice—that devoted to Fungus parasites. This part of Dr. Mayr's work, although it occupies but a comparatively small fraction of the whole, contains a number of errors and inaccuracies of statement which should hardly be allowed to pass without criticism. On pages 433, 434, the author enumerates thirty-four species of Fungus parasites, including two new genera and thirteen new species, although he expresses a doubt with regard to three of the latter. Besides the list to which we have referred there are notes and descriptions of some of the species of fungi scattered through the text.

If there is any genus of fungi found in the United States whose development has been more frequently and carefully studied than any other, it is probably the genus *Gymnosporangium*, and there seems no good reason why a foreigner writing on our fungi should not first read what has already been published in America as well as in Europe. Dr. Mayr cites *Roestelia lacerata*, Sow, on *Cratægus* as connected with *Gymnosporangium macrocarpum* on *Juniperus Virginiana*. But it is a well known fact, as shown by the cultures of Thaxter and confirmed by others, that the *Roestelia* in this case is not *R. lacerata*, Sow, but *R. pyrata* (Schw.) The name of the *Gymnosporangium*, moreover, is not *G. macrocarpum*, but *G. macrospus*, Lk., first described by Schweinitz in 1822 under the name of *G. Juniperi Virginiana*. The spelling cannot be considered a printer's error, for it is given as *macrocarpum* in the list and again incorrectly as *macrosporum* on page 195 and in the index. The author evidently has not studied with care the *Gymnosporangia* which abound in the United States, for on page 195, in speaking of *Juniperus Virginiana*, he says "Except *G. macrosporum*, which causes a witchesbroom distortion (Hexenbesen), the tree seems to have no enemies." The statement is incorrect in two ways. The witchesbroom distortion is not caused by *G. macrospus*, which produces the familiar "Cedar-apple," but by a different species. Furthermore, *J. Virginiana*, far from having no enemies, is peculiarly susceptible to the attacks of fungi, and, of the genus *Gymnosporangium* alone, *G. macrospus*, *G. globosum*, *G. clavipes* and one other species are common on that host.

The author records on leaves and shoots of *Fraxinus* an *Æcidium*, the species of which he considers to be in doubt. But why should there be any doubt? The species is one of the best known and most striking in appearance—*Æc. Fraxini*, described by Schweinitz in 1822. On the other hand, with regard to the new species which he calls *Rhytisma punctiforme*, the author has apparently no doubt; but, unfortunately, Dr. Mayr was anticipated by Fries, who described the fungus under the name of *R. punctatum* more than fifty years ago. There is cited on *Cornus florida* a *Microsphaera* (*Erysiphe*) *Corni*, n. sp., which is also figured under the name of *Podosphæra Corni*. As the figure apparently represents more than one ascus in a perithecium, the name *Podosphæra* was probably a slip of the pen; but the fungus, as far as can be told from the figure without a description, is the species described by Cooke and Peck as *M. pulchra*, and referred by some later writers to the older *M. Alni* (DC.), Winter, which is common especially on *C. alternifolia* and *C. stolonifera*. Certainly, without a differential diagnosis, one cannot suppose that *M. Corni* is other than the well known *Microsphaera* on *Cornus*, whatever view one may hold concerning the perplexing synonymy in this case.

Without stopping to consider other doubtful cases, it will be seen that Dr. Mayr is not well informed in the mycological

literature of the United States; and that being the case, it is to be regretted that he has ventured to introduce into a work, in other respects valuable, so many new names for species of fungi, some of which have for years been well known to American botanists and others of which are doubtful. We can only agree with Von Tubeuf, who, in his review of the present work, *Bot. Centralbl.*, xli., 415, says that "the presentation of new genera and species in the absence of descriptions and adequate figures, the material itself being unripe or imperfect, is not to be approved or acknowledged."

The Golden Flower, Chrysanthemum, is an elaborately illustrated book, lithographed and published by Prang & Company, Boston. The text is not strictly horticultural nor botanical, although much that is interesting in the history of the flower is given. It consists in the main of a collection of verses from various poets, arranged and embellished with original designs by F. Schuyler Matthews, and the whole is illustrated with reproductions of water color studies by James and Sidney Callowhill, Alois Lunzer and Mr. Matthews. The verses have been selected with excellent taste, but the book is meant primarily to be a work of art, in which the national flower of Japan is successfully used in a general scheme of decoration which is Japanese in its motive. Some of the panels in which the poems are set are admirably designed, and Mr. Callowhill has added some of his best floral work in the portraits of the different Chrysanthemums. Of these, eighteen varieties have been selected for their distinctness and decorative qualities, and the reproduction of form and color has been very successfully accomplished. Kioto, one of the famous Neesima collection, is exceptionally well done; Medusa, although not a pleasing flower in our judgment, appears in its most characteristic form, and Lilian Bird, in spite of the fact that no artificial color can equal in delicacy the shrimp pink of the original, will please all who are acquainted with this singularly beautiful flower. Cullingfordii, Mrs. Wheeler and Golden Dragon are also well done, and all the flower portraits are much above the current work of this kind.

Altogether "The Golden Flower" makes a beautiful book for the holiday season, and is most creditable to all concerned in its preparation.

Notes.

According to the *Critic*, Joaquin Miller has abandoned literature for arboriculture, and has already planted more than 20,000 trees on his estate at Oakland, California.

The death, at Nancy, is announced of Antoine Auguste Mathieu, one of the most distinguished students of forests in Europe, formerly Conservator of Forests of France, Assistant Director of the Forest School at Nancy and the author of the well known "Flore Forestière de la France" and of other important scientific works.

Mr. T. S. Brandegee has lately returned to San Francisco from another exploring expedition in the southern extremity of Lower California. He found the season there favorable for botanizing on account of the abundant rains of the past summer, and interesting results from his observation may be looked for in an early issue of the *Proceedings of the California Academy of Science*.

Mr. C. G. Pringle has lately returned to his home in Vermont from a most successful botanical season in Mexico. He brings home with him a collection of 20,000 specimens, and will return again to Mexico as soon as these are distributed. Mr. Pringle's investigations the last year have been largely devoted to the little known region east of San Luis Potosí, where he has discovered many new species, a large proportion being trees and shrubs.

At a horticultural exhibition held in Buda-Pesth last spring a single firm exhibited 1,500 Roses grown in pots, many of them being standards. Among these last was a gigantic *Marechal Niel* which measured ten feet in height and had a symmetrical head loaded with immense blossoms. A committee of ladies was appointed to pronounce upon the most beautiful variety of Rose exhibited, and their verdict gave the first place to Madame Charles Meurice, the second to Merveille de Lyon, and the third and fourth to Baron Adolphe Rothschild and Luciola.

Mr. R. Hector, of Placer County, California, told a convention of fruit growers at Santa Cruz that his famous Cherry-tree had brought him in a gross return of \$1,800 in five years. Last year its yield was 300 ten-pound boxes, and an average

price of \$1.50 a box has been received during five years. The tree is a Black Tartarian, thirty-five years old, sixty feet high, with a trunk which girths more than ten feet at a height of six feet above the ground. It stands in deep, rich sandy loam on bench land near the American River. The ground is irrigated each year immediately after the fruit, which matures very early in the season on account of the warm and sheltered location of the tree, is picked.

Under the heading "*Populus heterophylla*, L.," the editor of the *Bulletin of the Torrey Botanical Club* says: "Another locality for this rare tree in the middle states has been discovered by Rev. L. H. Lighthipe near Woodbridge, Middlesex County, New Jersey. The stations now known for it at the north, besides those given in my 'Catalogue of Plants for New Jersey' and its somewhat wide distribution on Staten Island, are Northport, Long Island, and Guilford, Connecticut, as recorded by Professor Sargent in his Forestry Report in the Tenth Census."

Herbaria were not common two centuries ago. Gibson, whose "Account of Several Gardens near London" was written in 1691, says of a Mr. Darby at Hoxton: "He has but a little garden, but is master of several curious greens that other sale-gardeners want and which he saves from cold and winter weather in greenhouses of his own making. . . . He is very curious in propagating greens, but is dear with them. He has a folio paper book in which he has pasted the leaves and flowers of almost all manner of plants, which make a pretty show and are more instructive than any cuts in herbals."

A correspondent of the *American Garden*, speaking of the many kinds of plants which are used for hedges in our southern states, says that one of the most beautiful for the purpose is the Gardenia or so-called Cape Jessamine. In the South Carolina garden where he saw it, "it flourishes in those parts of the shrubberies which lie on the edges of the Rice-fields, where it is valuable as being a handsome evergreen shrub which can stand water. During the spring freshets the family take to the canoes and are paddled between the rows of Gardenias, which hedge in a favorite walk, and which will emerge as green as ever from their bath of several weeks' duration. Even the smaller plants and cuttings do not object to a submersion which would kill the Magnolia and other native plants."

In his "Notes on England" the historian Taine has well expressed the difference between the type of garden developed in the south of Europe and that which owes its origin to England and has spread through all northern countries. For the inhabitants of the south, he says, a garden has always been a sort of open-air salon, the chief use of which is to provide a pleasant, convenient place for social intercourse. Thus, its formal, architectural design and artistic decoration with fountains, statues and balustrades is eminently appropriate; while, as the peoples of the north look upon a garden as a place in which to escape from men and commune with Nature, they have inevitably developed a style from which regularity and all other evidences of artificiality are banished in favor of arrangements which preserve or simulate the work of Nature herself.

A late bulletin from the New Jersey Experiment Station commends the potash salts as insecticides. It has been observed that farmers who use the muriate or Kainit in Corn-fields as a fertilizer have no trouble from wire-worms, white grubs or the Corn-root louse. Peach-trees have also been successfully planted in lice-infested orchards where all had formerly died by first treating the soil with Kainit. Professor Smith made some experiments of his own which substantiated the opinions of the farmers. He also tried solutions of the muriate and of Kainit for spraying, using one ounce to a pint of water in each case. The spray killed aphides on Wheat-heads and on Rose-bushes, and mealy bugs on greenhouse Camellias. In most cases the plants were uninjured, the Kainit inflicting damage more rarely than the muriate. Without further experiment these salts should be used with caution on foliage; but for underground species of destructive insects they should be tried whenever practicable. They have a high fertilizing value, and will help the plants to overcome insect injury by encouraging their growth as well as by destroying the insects.

Gotthelf Wilhelm Poscharsky, who held an honorable position among the landscape-gardeners of Germany, died recently at Dresden in the seventy-third year of his age. For many years he had been Court-gardener in that city, and to his labors as a cultivator added those of a designer in laying out some of

the gardens attached to the suburban residences of the royal family. In his youth he had studied architecture under the famous Gustav Semper, and this preparation stood him in good stead when he turned his attention to gardening. Before his appointment as Court-gardener he had designed many charming private gardens in the outskirts of the town which now have been swept away to make place for solid lines of buildings. But every visitor to Dresden must remember the splendid avenue of Chestnut-trees which leads from the Neustadt to the Waldschlösschen restaurant, high on the northern bank of the Elb; and this will long remain a monument to Poscharsky, as he planted the trees with his own hands about forty years ago. The beautiful gardens in Chemnitz were also of his creation.

The Boston *Advertiser* asserts that Dr. Hale thinks he has found a possible solution of the mystery which hangs around the origin of the name of Rhode Island. "In his wanderings about the country regions he has found that the Rhododendron grows luxuriantly all over the island in its season, and he queries within himself whether the early settlers may not have made use of this fact in selecting a name for their habitation." It is probable that this curious query originated in the mind of some newspaper hack, rather than in Dr. Hale's. Aside from the fact that the Rhododendron is very rare in all regions north of New York, it is difficult to suppose that men of a turn of mind at once so unscientific and so unpoetic would have named an island after a flower. It is still more difficult than to accept the common theory that they named it from its fancied resemblance in shape to the Island of Rhodes in the Old World. But even in the highly improbable case that a flower inspired the choice of a name, it would more likely have been the Wild Rose, the "Rhoda" of the Greeks, than the Rhododendron or "Tree-rose," since the Wild Rose grows as prolifically in this region as the *Advertiser* asserts to be the case with the Rhododendron, which only grows now in one locality within the state of Rhode Island, namely Worden's Pond, and is not known to have grown at any time on the island of Rhode Island.

The International Agricultural and Forestry Congress, which was held in Vienna during the month of September last, attracted some 1,200 persons. Its most important feature seems to have been an address delivered by Chief Forest-Master Prosper Demontzey, of Paris, on "The Works of Reforestation and Stream Correction which have been undertaken in France since 1860." The speaker was most competent to discuss his subject, having himself been at the head of many of the works in question, and the facts and statistics he gave, as we find them reported in *Gartenflora*, are extremely interesting. To show the damage which may be done by streams which have become what the Germans call "wild" in consequence of the deforestation of the high lands where they rise, he described the catastrophe at St. Pous (Hérault), in September, 1875, when, in a few days, 150 buildings were swept away, more than 100 persons perished, and a damage of over 3,000,000 francs was suffered. Such disasters are now prevented by replanting the high lands, by turfing the banks of the streams, and by regulating with dams the flow of the water. Of course, to accomplish these ends strict and far-reaching legislation, as well as a great outlay of money, has been required. The government has the right to expropriate such lands as it sees fit, and to enforce the execution of needful work by private individuals, assisting them with premiums or subsidies. A certain amount of return for the outlay comes from the land reclaimed from the beds of "wild" streams, which is often admirably adapted to agricultural purposes. During the twenty-eight years covered by the speaker's descriptions (1861-1888) an area amounting to 145,000 acres had been replanted. Sixty thousand six hundred acres of this were state lands, 50,200 acres belonged to communes, and 34,200 to private individuals who had been subsidized by the government. Twelve and a half million francs had been spent in the purchase of lands, and 25,000,000 had been expended in actual work upon these and other government possessions. Six million francs had been paid out in subsidies and 8,000,000 for salaries and other general expenses. Of the 25,000,000 credited to "actual work" on government property over 7,000,000 were spent in planting, about 12,500,000 in controlling streams and more than 5,500,000 on accessory works, such as road and fence building. As a total we see that 51,500,000 francs—more than \$10,000,000—have during twenty-eight years been spent by the French government in partially repairing the damage caused by just such a willful destruction of the forests as is going on to-day, with tenfold greater rapidity than ever in Europe, in almost every part of our own wide land.

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Elementary Botany for Young People.

LAST spring a child's paper published in Boston offered a reward to any little one who would collect between the 1st of May and the last of September fifty kinds of native flowers and send in a list of their names. A small boy in Newark, New Jersey, began with flowers of the Dandelion, Chickweed, Violet, Spring Beauty, and some others, found in back-yards and vacant city lots, and then, as his collection halted, his mother accompanied him on a short ride into the country one May afternoon, and the list was increased by the Columbine, Hepatica, Dog-tooth Violet, Azalea, Strawberry, Geranium and several more. This was the beginning of a quest which was kept up with unflagging enthusiasm until the season of Golden Rods and Asters, and now his mother, under the title of "A Memory of Summer," has just published in *The Sunday Call* an entertaining account of the little collector's work. The list numbers less than a hundred, but it is pleasant to learn that the writer now finds herself "associating certain times and places with the finding of certain wild flowers"; but the point of most importance is that the child has begun the study of botany, and has begun it in the field and not in a school-book.

At this age of the world there ought to be no need of explaining how the mental processes employed in the investigation of natural objects which come within the scope of a given science differ from those used in studying a written treatise on the same science. The ordinary method is to place a book before the child and bid him memorize the facts which have been discovered by others. What seems the more natural plan is to encourage him to study the objects themselves, to compare them and classify them—in short, to do exactly the kind of work that the most advanced scientific explorers are engaged in. It ought to be noted, however, that the profoundest investigator is only carrying on in remoter fields the work which every child begins long before he can read or even speak; that is, he is familiarizing himself, by the actual use of his senses, with the objects about him, and making himself systematically acquainted with their qualities. It would seem to be the

part of reason to encourage the exercise of those faculties which give habits of observation and comparison instead of permitting them to grow feeble through disuse during the years of school-life. No doubt it is proper to impart dogmatic information to the young, but it will hardly be urged that this is the chief end of an education. It is certainly worth something to a man to have eyes which do not fail to see the objects that surround him and a mind alert to note their relations and to draw inferences from them; and this is an equipment which the proper study of natural science furnishes.

Bearing in mind that the facts acquired are of less importance than the mental attitude and aptitude encouraged, the science of botany offers unusual advantages for developing the power of systematic observation. The material objects needed for the study are constantly present in infinite variety, abundance and beauty. In the example alluded to at the opening of this article flowers alone are spoken of, and if the sole use made of them was to identify the plants by name the educational value of the summer's collecting was comparatively slight. The naming of the plants is an unimportant matter compared with a study of their points of similarity and contrast and the effort to group them according to their affinities. But the flower is a small part of the plant, and the study need not lag when flowers are gone. Every tree now furnishes obvious characters in its general form, and in the way this form is developed by the peculiar ramification of its branches; in the color and texture of its bark, in the scars which show the arrangement of its leaves, in its spray and winter-buds. Broad leaved evergreens and conifers would furnish leaves if window plants could not be found in every house, and, as Professor Ward has observed, even at this season the nature of a Hyacinth-bulb can be studied in contrast with that of a Potato-tuber, and every nut or apple or orange that a child eats could be made an interesting study under proper guidance.

In short, there is no season when the child cannot make direct personal observations of plants, and when, under a skillful teacher, he cannot be drawn out into an intelligent description of what he sees. Moreover, there are no objects more attractive to the young, more agreeable or convenient to handle or better adapted to close observation and exact description. Professor Marshal Ward brought out these truths with great clearness in an address before the British Association for the Advancement of Science at its late meeting, and in regard to the proper method of teaching elementary observational botany he said :

The teaching of elementary botany to children should commence with the observation of external form, and might well be initiated by a comparative study of the shapes of leaves, the peculiarities of insertion, their appendages, and so on. The point never to be lost sight of is that if you teach a child to discriminate, with the plants in hand and from observation only, between such objects as the simple, heart-shaped, opposite, ex-stipulate stalked leaves of a Lilac, and the compound, pinnate, alternate, stipulate leaves of a Rose, you lay the foundations of a power for obtaining knowledge which is in no way to be measured merely by the amount or kind of information imparted. It does not matter whether the child learns the trivial facts mentioned above, or not, but it is of the highest importance that the child be taught how to obtain knowledge by such direct observation and comparison; and the beauty of it all is that, as is well known, the child will retain most of such information as mere matter of course.

There is one danger to be avoided, however. Young children should not be troubled with the difficulties of theoretical morphology; they should be made familiar with the more obvious roots, stems, leaves, tendrils, thorns, flowers, etc., and not forced to concern themselves with such ideas as that the flower is a modified shoot, the bulb a bud, etc., until they have learned simply to observe and compare accurately. Later on the step must be taken of rousing their minds to the necessity of drawing further conclusions from their comparative observations; but, if the teacher is really capable of teaching, it will be found that the children begin to suggest these conclusions themselves, and, this stage once reached, the success of the method is ensured.

The Beginnings of Fruit-culture in Germany.

AN article published not long ago in the *Illustrierte Gartenzeitung*, of Vienna, gave, on the authority of old state papers, some interesting facts with regard to the fruit-culture of former times in the kingdom of Wurtemberg. It seems that the earliest mention of this industry is found in accounts of the destruction of vineyards and orchards during the wars of the thirteenth and fourteenth centuries, while the first recorded edict for their protection dates from 1515, and imposes a fine on any one who shall cut down fruit-trees, wild or cultivated, on open grounds. Another edict, dated 1552, declares that children caught stealing fruit shall be punished by their fathers, or imprisoned, or put in baskets and dipped in the water. That wild fruits were still largely depended upon is proved by an ordinance of the year 1566, saying that a cultivator may pick up the fruit from wild trees, but must not shake them, as what remains on the branches must be left for the animals which at that period the upper classes so greatly delighted to hunt. It appears that the planting of fruit-trees was not prescribed until about 1600, when the setting out of Mulberry-trees was ordered. Each grown man under the age of forty was to plant one, and each stranger coming to reside in the province was to plant two on public land; and from later edicts it appears that the fruit of such trees could be gathered by the planter during his life-time and then by his widow, but that after her death they reverted to the commune. The edict of 1655, which declared that fruit-trees must not be planted nearer than seven feet and nut-trees not nearer than ten feet to a neighbor's boundary line, still holds good. The Mulberry continued in high honor through the eighteenth century, for we read of an order dated 1755 which prescribes the planting of all new roads with two lines of these trees, standing sixteen feet apart. In the following year Apple and Pear-trees are also named for such service, but merely in positions where Mulberries would not grow or bear. Only in 1792 was heed paid to the fact that the interval between the trees which sufficed for Mulberries was insufficient for the other sorts. Then a distance of twenty-four feet was prescribed for old roads and of thirty-two feet for new ones.

In 1718 a desire to maintain the reputation of the vineyards which produced the then famous Neckar wine, called forth an order against the planting of fruit-trees in vineyards, accompanied by sentence of immediate death against all that had already been thus planted, unless they were over fifty years of age, when they might be preserved until their time of bearing should be over. In 1723 a money reward was offered for the destruction of wasps' nests.

Until the end of the last century there were no nurseries of fruit-trees in Wurtemberg. The first was founded by Duke Charles Eugene when he established the *Karls Akademie* on his estate, "La Solitude," and decided that horticulture should be among the branches taught. The father of the poet Schiller was, after his retirement from the army, for many years director of this horticultural school.

Wine is, of course, mentioned very early in this series of public documents, but only in 1644 does one read of inns where beer as well as wine is sold, and drinks made from other fruits than the grape are not mentioned until 1650. The preparation on a large scale of all such drinks is then forbidden on account of the practice of using them to adulterate wine. It is only permitted to each farmer to prepare a certain stipulated small quantity for the consumption of his own household. Otherwise, it is declared, it would soon be impossible for the poor, and especially for women in childbed, to get their needful draught of pure wine, to say nothing of the ruin that might come on the country at large were this capital industry to deteriorate. A little later even the fabrication of small amounts of cider is forbidden; but it seems to have been impossible to enforce so radical a measure, and there is soon a return to laws which do not prohibit, but strictly control and limit its making. Not until 1735, however, was the sale of cider allowed, and even then the warning against its admixture with wine was reiterated. Sometimes the two beverages could not even be sold at the same time, though cider might be alone. The use of certain inferior kinds of fruit for brewing drinks is also often forbidden even at this late date. Much fruit seems to have been used in those days for cooking purposes, even more, proportionately, than at present, although the Germans are remarkable to-day for their love of this kind of food. Yet cooked preparations of fresh fruit seem to have been almost exclusively employed, for references to dried fruits are few, and the prices named for them in 1622 are so high that they appear to have been then a luxury. These careful and strict regulations, of which we have here quoted only a few among many, prove that the government of that time

took a truly paternal interest in the affairs of private cultivators as well as of the commune as such. But there can be no doubt that such regulations did much to encourage the development of local industries, or, at least, to keep them in the best path that the wisdom of the time could discover. Moreover, they were sometimes in the direction of enlarging, not restricting, the liberty of poor farmers, as is proved by a law of 1567, which gave them the right to transplant young wild fruit-trees from the forests without any payment therefor. This privilege was a greater one than it may seem to modern readers, for there were vastly greater numbers of such trees in the forests then than now; and it was also more of a concession than we can easily realize, for hunting was then the one great amusement of the rich, and not only beasts of the chase were carefully preserved, but likewise the woods wherein they found their food. It should be noted, however, that the permission is given for personal use only; no transplanted tree is to be sold, and it seems as though each peasant were allowed to take but a single tree.

Vancouver's Park.

IN Stanley Park the City of Vancouver has a unique possession. It is in fact a section of the original forest, with all that is venerable and impressive in such an object, connected with a brisk young city, where everything is bright and new. Five years ago not a house stood here, where 15,000 people are now riding in electric motor cars through streets brilliant with electric lights. The city has the best hotel in British Columbia, and one of the most beautiful theatres on the continent, and is in touch with cities east, west and south, and even with Alaska.

In the skurry of growth on our side of the border a park is one of the last things to be thought of. Here it was one of the first. This is because Vancouver is not a mushroom town, but is growing normally and soberly, and without the rush and ruffianism of most new settlements. The wealth of the province in fish, fur, gold, coal, building stone and timber made a town needful hereabout, and the Canadian Pacific Railroad focused it on Burrard Inlet by making that its terminus. The city stands on a peninsula of high and healthy land, with room for metropolitan expansion, and its pleasure-ground covers a second peninsula given off from this, a slightly elevated tract ten miles around. It is encircled by a road; a drive-way and a few corduroy paths have been run across it; at the entrance, which is reached from town by a pretty bridge crossing a salt inlet, there is a bit of lawn and garden, a keeper's cottage and a few cages of native animals—bears, wolves, foxes, badgers, hawks, owls and eagles; but except for these slight changes and additions, and the huts of a score or two of Indians, who enjoy squatters' rights and have not been asked to move on, this reservation is in a state of nature, and it is designed to keep it so, in so far as consists with public use.

An inhabitant of eastern towns finds this park unlike anything that he has seen before. It is covered with forest down to the edge of the sea; indeed, the trees lean above the waves and fall into them in their decay. Burrard Inlet on the east, "the Lions' Gate" on the north and the Georgian Gulf on the west enclose it with ocean water that softens and cools the air, while the spicy fragrance of Cedar enriches it. On the landward side, great mountains, peaked with snow and scarred with avalanches, tower in alpine majesty, and this combination of sea, mountain and forest cannot be matched on our north Atlantic coast. Everything has a luxuriance that suggests a warmer zone, even the kelp in the bay throwing its streamers on the tide to a length of eight fathoms from tip to root, and the trees on shore rising from one to three hundred feet high. These trees are the glory of Vancouver. The height of them is less striking when seen in mass than when seen alone, for the breadth of green detracts from the apparent altitude, just as the width of Niagara Falls has an effect, at first view, of diminishing their height; but when they stand alone, or when a cabin or other familiar object is near enough to offer a standard of comparison, one better appreciates their majesty. I found that the readiest way to guess their height was to imagine one of our sky-scraping New York flats erected beside them, and to mark off with the eye spaces of fifteen or twenty feet, the number of such intervals indicating the number of stories that such a structure would contain. I judged from this crude measurement that the Times and Tribune buildings would be nearly hidden, in many parts of the wood, from the view of a person who was so placed as to look over the tops of the trees.

The Douglas Fir here has its noblest growth, and it is little surpassed by the giant Sequoias of California. Its grace and shapeliness are no less remarkable than its height, for it has a

delicate taper and is as straight as a mast. Indeed, if ships could be fitted here their masts could be "stepped" as solid timbers instead of having the top and top-gallant masts added as separate pieces. A sea captain tells me that he saw a mast taken from one of these trees, on Puget Sound, 104 feet long without a knot or branch in its entire length, while the bark was so thin, as compared with that of the Redwoods, that it gave no trouble to the strippers; and a scientist in Canadian service tells me that he measured one tree that threw its first branch 160 feet above the ground. It is from solid trunks of this tree that the Siwash hew their gondola-like canoes, which in their proportions and evenness of balance would be a credit to any boat-builder in the world. The huge limbs of the Fir give to the avenues of Stanley Park the shadowy solemnity and beauty of cathedral aisles, and the greenish brown moss with which many of them are draped may be compared to moldering banners such as hang from the walls of Henry VII's chapel in Westminster. Walking in these magnificent forest-arches, breathing their sweet air, listening to the mysterious music that the wind is making overhead and feasting on the rich color of the foliage, one feels the same uplifting of spirit that comes in the presence of grand mountain scenery, for the trees seem to be as distinctly types of greatness and endurance as the hills.

While the few deciduous trees that have gained roothold flourish like the evergreens they do not gain so great a size, although Poplars will be found not less than 100 feet in height. It is in the undergrowth, even more than in the trees, that the fatness of the soil and the indulgence of air and rain and sunshine are perceptible, and especially is this true of the Ferns, for the dainty Aspidium of our eastern fallows is here knee-high, and the common road-side Brake is nearly as big as an Elder-bush. Without choosing a particularly large one to measure by, I stood beside one of these plants, and straightening the stem, found that its upper frond was at least seven feet above the ground. One is occasionally startled by the glide of a snake and the whirr of a partridge, but as hunting is forbidden in the park it is not likely that this splendid undergrowth will ever be trodden down. The only thing to dread is that fire may somehow reach the wood, and that such disheartening damage may be wreaked as careless men have wrought among the Selkirks and in the valleys of the Fraser and Columbia, where miles on miles of wood like this have been converted into charred fields dotted with gaunt skeletons of Cedars, Hemlocks, Firs and Spruces. The greatest value of Vancouver's park is that it exhibits a native product at its richest. The illustration on page 635, which shows the wealth of this forest-growth, is taken from a photograph by Notman.

Brooklyn, N. Y.

Charles M. Skinner.

Basket-Work of the North American Indians.—II.

THE conifers contain a certain number of plants of great value to the native basket-maker. The best known is the Great Cedar or Arbor-vitæ (*Thuja gigantea*) of the coast ranges and Cascade Mountains of Oregon and California. This tree has a thin fibrous bark coming off in long ribbons, of which the Indians make mats, bags, baskets and articles of dress. Says Dr. O. T. Mason, in the article already quoted: "Mats, wallets and rectangular baskets are produced by the plainest crossing of alternate strands varying in width from a millimeter to an inch." . . . "Cedar mats of great size, and made with the greatest care, enter as extensively into the daily life of the Indians of this vicinity (coast of British Columbia) as do the buffalo robes into that of the Dakota Indians. They may be seen upon the floors, sleeping berths, before the doors of the houses, and they are also used as sails for their boats and are wrapped around the dead."

The roots of several conifers supply excellent material for the woof of basketry, varying in color from gray to light red and dark brown. The Hoopa and Klamath Indians use the roots of the Bull Pine (*Pinus Sabiniana*), gathering large pieces, sometimes six inches wide, which they prepare by parching in hot sand. The roots of the Spruce (*Picea Engelmanni*, and probably others) are quite tough, and a common basket-material of the north-western Indians. The roots of the Tamarack (*Larix occidentalis*) are used by the Indians on the headwaters of the Yukon River for "basket kettles," which are woven very neatly, and ornamented with hair and dyed porcupine quills. The dye is obtained from "berries and a kind of grass growing in swamps." (Smith's Rep., 1856.)

Pitch is frequently employed by the Indians of the Great Basin of Arizona and New Mexico to render their trays and jars water-tight.

Of the *Liliaceæ*, the Yuccas stand foremost as basket and

textile plants. Their fibrous leaves furnish excellent material to the Apaches, Pimos, Pueblos, etc. The *Yucca filamentosa*, *Y. gloriosa* and *Y. aloifolia* were formerly held in some esteem in the eastern and southern states for the manufacture of string, rope, mats and other household articles. In the great interior arid region, from California to Texas, *Y. baccata* is of decided economic importance. The full grown leaf is three to four feet long, tough and pliable, and yields an excellent textile fibre; when slightly parched in ashes it becomes still more supple, and may be split into strands of various sizes, which are woven into coarse mats and baskets, and otherwise used as whips, withes and rope by Mexicans and Indians. The leaves of the allied species, *Y. filifera* of northern Mexico, are equally good; valuable also for the same purposes are those of *Y. angustifolia*, *Y. elata* and *Y. Whipplei*.

To the same family belongs the *Xerophyllum tenax* of the Pacific coast, a common perennial with numerous radical, narrowly linear leaves two to three feet long. These leaves do not contain textile fibres, but are sufficiently strong and flexible for weaving, and are largely used by the Indians of northern California and Oregon for the white groundwork of their finer grades of basket-work.

Several species of Agave (*A. Americana*, *A. heteracantha*, *A. Sisalina*, etc.) are well known textile plants also, turned to good account by the Indian and Mexican basket-makers.

It will probably be a matter of surprise to most botanists to hear that the leaves of *Iris macrosiphon* are much used in northern California and in Oregon to make ropes, fish-lines, nets and a cloth hardly distinguishable from coarse canvas. I have received interesting specimens showing the various steps of the process. The leaves are one to two feet long and one to three lines wide, each with two strong fibres forming the edges. These fibres are dexterously separated by the squaws with a sharp zinc thumb-piece, then neatly and evenly braided into cord of variable size, or otherwise woven into nets, cloth, etc. The leaves of the Palmetto (*Sabal Palmetto*) yield fine pliable strips, from which are made hats, mats, baskets, etc.; doubtless those of the *S. Mexicana*, which extends northward to the Lower Rio Grande, are used for the same purposes by the Mexicans. Those of the Saw Palmetto (*Serenoa serulata*) are made into hats and baskets by the negroes.

Even the Ferns contribute several useful plants to our list. The Chain-Fern (*Woodwardia radicans*) of the Pacific Coast has long stalks, each containing two fibre-vascular bundles in the shape of large, flattened, brown threads, tough and flexible. While still fresh the stalks are bruised and pounded so as to liberate the threads, which are then cleaned and stained in an infusion of Alder bark. These threads become brittle in drying and must be used moist. Another Fern affording an elegant material for the woof of the nicer caps and baskets of the Hoopa and Klamath Indians is the Maidenhair (*Adiantum pedatum*). The stems are of a deep, lustrous black on one side and red on the other; after being soaked in water or wet with saliva, they are split open with the finger-nail so as to separate the black skin from the unused red side.

The bast of the Lime or Linden-tree (*Tilia Americana*) is exceedingly tough and strong, and readily made into cordage, matting and baskets. The wood and bark of the Leatherwood, a shrub common in the Atlantic States (*Dirca palustris*) and on the Pacific Coast (*D. occidentalis*), have always been extensively used by Indians and settlers. The bark is almost as strong and useful as that of the Lime-tree; the wood is soft, tough and flexible, so that branches can be bent into hoops without breaking. The bark of the Canoe Birch, as everybody knows, is readily and frequently made into jars and baskets in the region of the Great Lakes.

The wood of several hard-wood trees, cut into thin boards, ribbons or shavings, is sufficiently elastic to lend itself to basket-work; that of the White Oak (*Quercus alba*) and of several species of Hickory (*Hicoria*) was formerly much used for this purpose. The soft wood of the White Birch (*Betula populi-folia*), and of other white-wood trees, is still employed along our northern frontier and in many parts of Canada by the descendants of the Algonkins and Iroquois. Thousands of their pretty baskets, wrought into many shapes, are sold in the towns and villages of the northern states.

Rushes, on account of their abundance, softness and pliability, have been more or less used by many tribes. Pretty specimens of Rush basketry, made by the Klamath Indians from undetermined species, are found in the National Museum. The *Juncus effusus*, often a weed in the Atlantic States, is said to be cultivated in Japan for the manufacture of fine floor-mats. The tough scapes of *J. robustus* are split by the Indians of south California and wrought into the material of their baskets.

In the Sedge family we have the common and widespread Bulrush (*Scirpus lacustris*) frequently employed by Indians to make mats, loose baskets, and as thatch for their huts; the var. *occidentalis* or "Tule" of the Pacific Coast, often eight or ten feet high, for these and other purposes is a plant of economic value.

Lastly let us mention the Cat-tail (*Typha latifolia*), whose leaves, twisted together, have, since the colonial days, been used in making chair bottoms. According to Professor Dudley they are now collected quite extensively in central New York for the manufacture of chair-bottoms and baskets.

The Indians have a great fondness for color, and, besides the many shades of the raw material, often use native dyes with excellent effect. The bark of several species of Alder yields, by infusion, a very good coloring matter; this bark, at first grayish white, becomes bright red by exposure. The Hoopa and Klamath Indians use the bark of *Alnus rhombifolia* (perhaps also that of *A. rubra*), the Navajos that of *A. incana*, var. *virescens*, which, says Dr. W. Matthews, U. S. A., they combine with the root bark of *Cercocarpus parvifolius*, using juniper ashes as mordant.

In the Great Basin the black dye used in the ornamentation of baskets is obtained from *Suæda diffusa*. A black dye is also made by the Navajos from the berries of *Rhus aromatica*, var. *trilobata*, by mixing them with ocher and the gum of *Pinus edulis*.

Fort Buford, N. Dak.

V. Havard.

The Spotted Willow-twig Aphis.

OUR various species of Willow are particularly subject to the attack of aphides or plant-lice. No less than nine of these insects have been described as occurring upon them. No part of the tree, unless possibly the roots, is exempt from attack; and the bark and twigs receive the exclusive attention of at least five species. Some of these often become seriously injurious, and more frequently, perhaps, their presence is extremely annoying where they occur upon shade or ornamental trees in private grounds or public parks.

The aphides most commonly found upon Willow-twigs belong to the genus *Melanoxanthus*. Three American species of the genus are known. The Willow-grove Aphis (*M. salicis*) is probably the most abundant in the eastern and middle states. It is very similar in appearance and habits to the nearly related Spotted Willow Aphis (*M. salicis*), which is represented in the accompanying figures. This insect lives over winter in the egg state on the bark of Willow-twigs. Early in spring the eggs hatch into young plant-lice that insert their tiny beaks into the bark of the tender twig and suck out the sap. They grow rapidly, and each one soon becomes the mother of a dozen or more young aphides. Hence these lice are called viviparous. The generation that came from the egg are all wingless, but the young borne by these probably develop into both wingless and winged forms, which are also viviparous. Successive generations continue to appear throughout the entire summer, all being viviparous, and some having wings, while others have none. By midsummer they often have increased so enormously as to cover all the twigs of infested trees, making them appear filthy and unsightly, as well as impairing their vitality by extracting the sap. A single one of the lice hatched

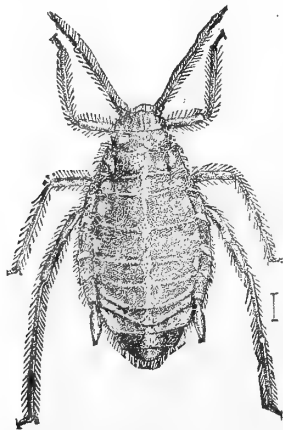


Fig. 83. SPOTTED WILLOW-TWIG APHIS. OVIPAROUS FEMALE. (MAGNIFIED.)

from the egg in spring may become the ancestor of many millions before autumn. But in October a true sexed generation develops, the males being winged and the females wingless. By the union of these the true fecundated egg is obtained.

The egg-laying female is represented at Fig. 83. It is about one-fifth of an inch long, bluish black in color, with a glaucous bloom, and has a distinct white line along the middle of the back. There is also a row of white spots along each side. The honey-tubes or cornicles are bright orange yellow. The

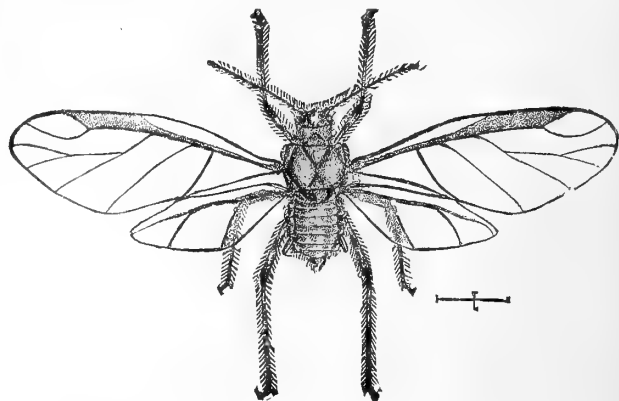


Fig. 84. SPOTTED WILLOW APHIS. WINGED MALE. (MAGNIFIED.)

wingless viviparous female is much like this in general appearance.

The winged male is represented, magnified, at Fig. 84. It is one-fifth of an inch long, with a wing expanse of one-third of an inch. The body is bluish black, with the wings hyaline and their veins yellowish brown.

The egg-laying habits of this insect are peculiar. The oviparous females apparently congregate for the purpose of depos-



Fig. 85. EGGS OF SPOTTED WILLOW-TWIG APHIS.

a, Egg, magnified; b, Eggs and oviparous females on Willow-twig.

iting the eggs in one or a few places on the tree. There they will cover the bark with them, as represented at Fig. 85, b. The egg itself is shown magnified at a of the same figure. It is about one-twentieth of an inch long and oval in form. When first laid it is covered with a liquid which on drying becomes grayish, giving the egg a peculiar appearance. Under the microscope the structure of this gray coating suggests a thin covering of felt.

The artificial remedies ordinarily used for plant-lice are applicable to this species. Kerosene emulsion and whale oil soap are the standard remedies for this class of insects.

Ohio Experiment Station.

Clarence M. Weed.

Plant Notes.

Some Recent Portraits.

OF the plants figured in the December issue of the *Botanical Magazine*, the number which completes the one hundred and sixteenth annual volume of this, the most venerable of the publications of its class, the most interesting from a garden point of view is the beautiful purple-flowered *Thalictrum Delavayii* (t. 7152), a native of the mountains of Yunnan, and one of the first of the numerous plants discovered by the Abbé Delavay to flower in Europe. It is a slender herb, two or three feet high, with long-petioled, ternately decomposed, radical leaves, triangular in outline, and ten or twelve inches

broad, with wiry, dark purple petioles. The leaflets are a third of an inch broad, obtusely three to five lobed, with a cuneate, rounded or cordate base. The pendulous flowers are pale purple, in very lax panicles, and are borne on long, slender, decurved pedicels. The flowers are an inch across or rather more when expanded, with elliptic-ovate, obtuse ribbed sepals. The affinities of *T. Delavayii* are with *T. Chelidonii*, a native of the Himalayas.

Other plants figured in this issue are *Rhodostachys Andina* (t. 7148), an ornamental Bromeliad inhabiting the Cordilleras of the northern provinces of Chili; *Scaphosepalum pulvinare* (t. 7151), a native of New Granada, and the representative of a small genus of Orchids whose distinctive characters are the superior lip, the free or nearly free dorsal sepal, the lateral sepals connate under the lip, and the strongly recurved upper lip. If we are to judge from the present figure, this plant has little to interest the cultivators of handsome plants; *Arisema fimbriatum* (t. 7150), and *Rhododendron Boothii* (t. 7149), a handsome Bootan species with yellow corolla and conspicuous scarlet stamens, discovered with several other species forty years ago by Booth, who visited India at the instigation of his uncle, Mr. Thomas Nuttall, a familiar and revered name among the cultivators of botanical science in America, for the purpose of collecting seeds of Himalaya Rhododendrons. The editor, Sir Joseph Hooker, adds to his description of this species some interesting remarks on the distribution of the genus, which he believes, judging by the results of botanical explorations recently made in western China, will probably far exceed, in the number of its species, all previous estimates which have been made with regard to it, the discoveries made in the eastern Himalaya being only harbingers of what the vast mountain regions further east may be expected to yield in new forms of Rhododendrons. The genus, which is represented in western Europe by three species only, with two additional in the southern Caucasus, develops remarkably in the Himalaya region from west to east. Four species are found in the western Himalaya, while in Sikkim twenty-nine have been collected. Bootan has twenty-five species, of which seventeen occur also in the Sikkim provinces; but Sir Joseph Hooker believes, "considering how imperfectly that great and lofty province has been explored (its alpine regions not at all) it may safely be assumed that this number does not include half of what it contains." East of Bootan little is known of the vegetation until the borders of China are reached, and here in the western mountains between sixty and seventy species of Rhododendron have already been discovered, although only fragmentary explorations have yet been made; and it is, therefore, not impossible that the Chinese Empire may contain more species of the genus than all the rest of the world besides.

Foreign Correspondence.

London Letter.

WITH the thermometer registering from six to twelve degrees of frost almost daily, and a dense fog which has continued night and day for nearly a fortnight, the difficulties of in-door gardening in the neighborhood of London have been unusually trying lately. Soft-wooded plants, such as Begonias, winter-flowering Acanthads, etc., have been almost denuded of leaves as well as flowers. The only houses in which there is anything like interest are the Orchid-houses, and even here many flowers have suffered from the effects of the fog. Calanthes appear as though they had been boiled; the buds of Phalænopsis have turned yellow and fallen, whilst even such strong flowers as Cypridiums, Dendrobiums and Lælias are affected in color and durability.

VANDA GIGANTEA.—This is a magnificent Orchid, well named both in regard to its foliage and flowers. Flowering at this time of the year it is exceptionally valuable. Its leaves are stout, leathery, a foot and a half long by nearly three inches in width. The raceme is produced near the base of the stem, and is a foot long, as thick as a goose-quill and bears about a dozen flowers. These are composed of five ovate fleshy segments (sepals and petals) almost equal in size and arranged regularly round the small clavate labellum, forming a cup two and a half inches across. Their color is bright cowslip yellow, with blotches of cinnamon; the back of the sepals is tinged with purple. This is a good plant for large tropical houses, as is also its near ally, *V. Batemanni*. According to Griffith *V. gigantea* is a native of Burma, and is usually found on the trunks of *Lagerstræmia Flos-regina*.

CYMBIDIUM TRACEYANUM.—This is a provisional or rather unauthorized name for a remarkable Orchid which has lately

flowered with Mr. Tracey, nurseryman, Twickenham, who exhibited it at the last meeting of the Royal Horticultural Society. It is probably a large flowered variety of *C. Hookerianum*, Reichb., f., as it resembles that species in every character except the size of the flowers. These in *C. Traceyanum* measure five and a half inches across; the sepals are an inch wide, the petals slightly narrower and the lip one and a quarter inches across. In color there appears to be no difference between the flowers of this and of *C. Hookerianum*. Mr. Tracey obtained his plant from an importation of *C. Lowianum*.

There are four recognized species of this section of Cymbidium, all of them natives of the Sikkim Himalayas. They bear a close resemblance to each other—so close that some botanists would not hesitate to unite them as forms of one somewhat variable species. They are *C. giganteum*, *C. Hookerianum*, *C. longifolium* and *C. Lowianum*. The first of this quartette is an old garden plant, but it rarely occurs in cultivation now. It was introduced into England about fifty years ago. The flowers are about three inches across and colored dull green, with brown longitudinal stripes on the sepals and petals, the lip being yellowish, with dark red spots.

C. HOOKERIANUM was introduced and flowered by Messrs. Veitch about the year 1860, but was not named until six years after, when Reichenbach named it in compliment to Sir Joseph Hooker, "with the writer's best wishes as a gratulation for the first new year's day of his Kew directorship." It has broader leaves than *C. giganteum*, and flowers nearly five inches across; the sepals and petals are apple green, with lines of cinnamon brown, the lip and column yellowish white, with numerous purple spots. As already stated, except that the flowers are a little larger, I cannot see how Mr. Tracey's plant differs from this species.

C. LONGIFOLIUM was described by Don, but did not get into English gardens until 1873, when it flowered with the Messrs. Veitch. It differs from the two species already referred to in its narrower leaves, smaller flowers, and in the evenness of the anterior segment of the lip, that organ being crisped in the other two. I have, however, seen it and *C. giganteum* in flower together, and could see no appreciable difference between them in the size, color or form of their flowers. *C. longifolium* is found at an elevation of 6,000 to 7,000 feet on the Sikkim Himalaya.

C. LOWIANUM is the most ornamental of the four, a good variety of it being a really grand plant when well grown and carrying its long spikes of large, lasting flowers. It was introduced by Messrs. Low & Co. in 1877, and described in that year by Reichenbach as *C. giganteum*, var. *Lowianum*, with this reservation: "It may even prove to be a new species, yet I do not dare to speak about this question from the materials actually at hand." Two years afterward the Professor raised it to the rank of a species, and in the same year a fine picture of it was published in the *Gardeners' Chronicle* from a plant flowered in the Clapton Nurseries.

These four, or, including *C. Traceyanum*, five Cymbidiums have long, arching, dark green leaves in tufts, and when well treated they form handsome specimen foliage plants. They are not difficult to flower, and their long, many-flowered spikes are very ornamental, notwithstanding the quiet colors of the flowers. The largest specimen Orchid ever seen in cultivation was a huge plant of *C. Lowianum* exhibited in London by Baron Schroeder last year.

CYPRIPEDIUMS.—There were some interesting hybrid Cypridiums exhibited at the meeting of the Royal Horticultural Society on December 9th. The most beautiful was Messrs. Veitch's *C. Niobe* X, noted by me last year about this time. It is the outcome of a cross between *C. Fairreanum* and *C. Spicerianum*, and both in form and color it is of exceptional merit. Were all hybrids in this genus as attractive as this, one would have nothing but praise for those who raise and distribute them. Unfortunately, good hybrid Cypridiums are the exception, not the rule. If one breeds pigeons or dogs or even cabbages he destroys all the progeny that are inferior to the parents; but a hybrid Cypridium is honored with a name, a picture, a glowing description and often with a big price for no other reason than that it is of hybrid origin. If compared with its parents it very often proves inferior to both as an ornamental plant.

Mr. Sander also exhibited a fine hybrid named *C. Pollettianum* X, interesting as being the offspring of two hybrids—namely, *C. calophyllum* X and *C. wnanthum superbum* X. The last named is a beautiful Orchid, and *C. Pollettianum* is at least its equal in size, form and attractive colors. The dorsal sepal is large, deep port-wine purple running into lines toward the apex, the upper portion being rosy margined with white. The petals are dark purple, almost black, paler about the base,

where there are a few black eye-like spots; the pouch is rich brown-purple. The whole surface of the flower is very glossy. It is a dusky beauty and certainly one of Mr. Sander's best hybrid productions. *C. Castleanum* × also received much attention and was admired by many. It is the production of *C. superbiens* and *C. hirsutissimum*. The flower is large, claret-red, with a shade of purple and small black spots on the lower part of the petals. The lip is like that of a good variety of *C. hirsutissimum*. Mr. Sander is prouder of this than of any of his hybrids.

Other Cypripediums exhibited were *C. insigne longisepalum*, characterized by a long dorsal sepal, otherwise a poor form of a good, useful Orchid; *C. Alcides* × from *C. insigne* and *C. hirsutissimum*, worthless in comparison with its parents; *C. Orpheus* × from *C. venustum* and *C. callosum*, and certainly unworthy of so good a name. A plant called *Silenipedium Weidlicheanum* ×, with *S. Hartwegii* and *S. Schlimii* for its parents, scarcely differs from the old *S. Sedeni*. *C. Maynardi* × is the result of crossing *C. purpuratum* with *C. Spicerianum*, and is not unlike *C. Lathamianum* × described two years ago. The largest flowered hybrid Cypripedium hitherto raised was one shown under the name of *C. Osbornei*, the offspring of *C. Spicerianum* and *C. Harrisianum superbum*. The dorsal sepal is two and a quarter inches by two inches, and white, except toward the base, where it is dull red, a line of the same color extending up the middle to the tip. The petals are three inches long by one inch in width, and the pouch in front two inches long and one and a half inches wide. The color of these parts of the flower is glossy brown-purple. Altogether a remarkable flower.

Cælogyne barbata, with seven flower spikes about eighteen inches long and bearing about forty expanded flowers, deservedly obtained a cultural commendation. The white flowers, with a patch of brown-black on the front lobe of the hairy lip, were pretty as well as being unusual. *Lælia anceps*, bearing about thirty spikes, each with two or three expanded flowers, proved its excellence as a winter blooming Orchid. *L. Tresiderianum* ×, a hybrid from *L. crispa* and *Cattleya Lodigesii*, was represented by a well-flowered specimen, as also were the deep rose-crimson colored *L. Gouldiana* and *Cattleya O'Brieniana*.

London.

W. Watson.

Cultural Department.

Fern Notes.

THE multitude of forms and habits to be found among Ferns gives opportunity for displaying their natural graces in a great variety of ways. Some of them, for example, can be very effectively used on pedestals or in baskets for conservatory adornment, and it may be worth while to give a small list of sorts especially adapted to this purpose. The sorts referred to may, as a rule, be readily obtained, and they do not require special attention in order to induce them to grow, they being strong-growing species that are content with reasonable care.

The soil should be an open, well drained mixture, as all vigorous Ferns will enjoy liberal watering, and the temperature should be fifty-five to sixty degrees at night in all cases, although *Woodwardia radicans* and *W. orientalis* do better in a lower temperature, say forty-five to fifty degrees at night, and under these conditions are less liable to the attacks of thrips.

The first to which attention is directed, and certainly one of the most graceful Ferns in cultivation, is *Goniophlebium subauriculatum*, a South Sea-Island species that has long been in cultivation, but yet is not nearly so common as its merits deserve. It has bright green pinnate fronds that sometimes attain a length of eight to twelve feet, and the fronds being freely produced and pendulous in habit, make this plant one of the most striking pedestal ornaments that can be imagined. The sori or fruit-dots of this species are also quite noticeable, being very similar to those of some of the Polypodiums, bright yellow in color and so deeply sunk in the frond as to produce a little protuberance or wart on the upper surface. In fact, the characteristics of the *Goniophlebium* have induced some authorities to class them with the Polypodiums, and the plant in question is frequently labeled *P. subauriculatum*, while it has also been called *Schellolepis subauriculatum*.

Another fine plant of the same family is *Goniophlebium verrucosum*, which is somewhat similar in habit to the preceding, but has broader fronds and pinnæ. *G. verrucosum* is also pendulous, but its fronds seldom exceed four to six feet in length.

Nephrolepis davallioides furcans is a fit companion plant for the foregoing, being so strong and rapid a grower that it forms a perfect fountain of fronds five or six feet long when grown under congenial conditions. This fine plant is a crested form of *N. davallioides*, and is not only extremely handsome as a pedestal or basket plant, but is also one of the most effective varieties for exhibition, while the fronds being of good texture are useful for cutting.

One or two of the stronger Lygodiums may also find a place in our list, notably *L. volubile* and *L. dichotomum*, both of which are fine sorts with large, dark green pinnæ, and the scant habit so well known in the Hartford Fern (*L. palmatum*), the American representative of this genus. *L. volubile* and *L. dichotomum* are both quite strong in growth and evergreen, the fronds continuing to grow until they reach a length of several feet.

Davallia solida will also become a handsome specimen when well treated, and is best suited for basket cultivation. It is a native of the Malay Islands, and produces a strong rhizome, from which issue its dark green fronds, arching in habit and about two feet long.

Woodwardia radicans and *W. orientalis* are both highly ornamental cool-house species, the first being found in portions of Europe, Asia and America, while the latter is also Asiatic, being found in China and Japan. *Woodwardia radicans* has already been described in these columns, but it may be repeated that the fronds are produced from a decumbent rhizome, are three to six feet long, pendulous and dark glossy green in color, and are frequently viviparous.

W. orientalis has much broader fronds than the preceding; but they are not nearly so long, and are usually dotted all over the upper surface with a profusion of young plants.

The Woodwardias may be potted in a somewhat heavier soil than the preceding species with good result, but the drainage should be thorough, as they enjoy an abundance of water, and during the summer are benefited by syringing overhead. Some of the best plants I have seen were grown in a house of Camellias, with which plants they shared the syringing.

Holmesburg, Pa.

W. H. Taplin.

Tuberous Begonias.

THE cultivation of tuberous-rooted Begonias is so easily managed that these beautiful flowers should have a place in every garden as well as in every conservatory. The dry tubers should be obtained early in spring, say in February or March, when they can be had at a very moderate price. It must not be expected that there will be a great percentage of really fine flowers in the cheap kinds, as the best varieties are selected for their superior qualities in color, size and form, and are kept distinct and sold at a dearer rate. Nevertheless, the cheaper varieties are good enough for general bedding if obtained from a reliable source. When an absolute color is desired we must take a named variety of the given shade; but if varying shades are not objected to, then it is as well to get seedlings. The largest tubers are not always the best. Indeed, in my experience with both single and double varieties, I have found that the larger bulbs produced plants of coarser habit, and with foliage and flower lacking some of the finer qualities of those produced from moderate sized tubers. In any case the tubers should be plump and well developed.

The time of starting the roots must depend upon the time when flowers are wanted. If required for early blooming in the greenhouse or window they should be started in gentle heat about the middle of February in an open light position. They should be potted in single pots a little larger than the bulbs, using a soil composed of light loam, sharp sand and leaf mould in about equal parts. Good drainage is an essential in growing Begonias in pots, and when potted they should be placed in a temperature of sixty-five degrees, giving ample ventilation without exposure to cold draughts. The tubers will then seldom fail to grow, no matter where placed on shelves or benches, provided there is sufficient heat. When first potted sufficient water should be given to moisten the soil thoroughly and equally, and this condition of moisture should be maintained, avoiding a sour or sodden soil at any time. When the plants have pushed up two or three leaves and the roots have begun to show themselves around the inside of the pots, they are fit to be potted into larger pots in a compost containing a trifle more loam than that in the smaller pots, and this will promote a sturdier growth.

Plants so started will commence to flower about April and continue to do so throughout the entire summer. If flowers are not wanted before June, March or the 1st of April will be early enough to start the roots. At this time less artificial heat

is required, and the warmth of an ordinary greenhouse will suffice to start them into growth. I always prefer a little heat at starting, whatever the season, as I find they will grow more evenly instead of straggling along one after the other.

and lightly covered with the soil, which is gently pressed together and sprinkled with water enough to moisten it throughout. This moist condition should be carefully maintained and the boxes kept in a gentle hot-bed, where care



A Roadway in Stanley Park, Vancouver.—See page 630

A very satisfactory way to start Begonias in the end of March or April is to plant the tubers in boxes about three inches deep, well drained and in the same compost recommended for pot culture. The bulbs are placed close together

should be taken to avoid a steamy atmosphere, which is likely to occur if sufficient ventilation is not given. Treated in this way they grow into vigorous plants. When they have formed one or two leaves they should be carefully lifted and set in

suitable sized pots, using the same soil as heretofore advised. Peat should never be used when leaf-soil can be obtained; but whatever materials are used they must be open and light, so that water will quickly pass away. With small pots little drainage is required. When potting the soil must not be pressed close. One or two taps on the bench is sufficient, especially for the single varieties. In potting the bulbs into five-inch or six-inch pots the tubers should first be barely covered with soil, and they should be placed as near the glass as possible. If plants for exhibition are desired they will need larger pots, and the shift should be made as soon as the roots touch the sides of the pots, for it is of prime importance that the plants do not become pot-bound; nor should they be allowed to become dry at the bottom, and if this condition should happen a thorough soaking should be given by dipping the pots into a bucket of water. The soil for a shift into seven or eight-inch pots should be heavier than that first used—that is, it should contain a little more loam, to which may be added a little well decayed hot-bed manure. The compost must not be sifted, but used coarse, but well mixed. Nothing like a rank manure must be used. The soil should be made moderately firm. Loose potting and rich soils conduce to a soft and rapid growth which will not flower as well until it has become hardened and matured. It should be always understood that it is of little use to pot plants that have reached their blooming stage. This work must be done before their roots have become matted round the pots.

Any plants required to form large specimens should have a vigorous growth encouraged from the start until they occupy their flowering-pots. They need light, rich soil, with a fair amount of heat and a moist air, with careful ventilation; but a stuffy atmosphere must at all times be avoided, as this will not permit the solid growth which alone gives flowers of the greatest substance and quality. When plants are showing their flowers in the greenhouse they should have a position where the air is constantly passing under and among them, otherwise they will decay or damp off in dull or wet weather. It will be of great benefit to the plants to get once a week a little weak sheep-manure water. When the plants have done flowering, which will be about the middle of October or the beginning of November, water should be withheld entirely so as to ripen the tubers, and this can be easily done by placing the pots on their sides under the stages or some other place out of the reach of frost, where they can remain until they are required again next year. The bulbs will require larger pots to start in by reason of their increased size.

As a bedding plant these tuberous Begonias have no rival. Easy culture, freedom of bloom and neatness of habit commend them to every one. For garden decoration the resting tubers should be procured about the end of March in different colors—crimson, scarlet, rose, pink, yellow and white, or mixed if preferred. The bulbs are best started in small pots in a cold-frame, or they can be started in boxes in windows, giving sufficient ventilation to avoid a spindly growth, and gradually hardened to the outside temperature. When they have formed two or three leaves and are well rooted they are ready for their summer quarters, which will be about the 1st of June. The beds should be prepared as for Geraniums or Coleus. When the plants are set they should for a few days be given a slight shading. A watering with a sprinkler should be given, and repeated often at evening during the dry summer months. A few stakes or light wood branches may be used to support them, as frequently the great weight of the flowers will carry the stems to the ground, and thus disfigure them. Neither rains nor dry, sunny weather affect their abundant bloom, which will continue until frost, when the tubers should be carefully lifted, slightly dried, and placed away in the cellar or on shelves in boxes like Dahlias until required the following season. Year after year they will increase in size and strength, producing finer flowers in greater abundance. The single Begonias can now be obtained at a very moderate price. Good double ones are still dear.

New Rochelle, N. Y.

Henry McCrowe.

Brodiaëas.

THE range of this genus is almost as wide as that of Calochortus. California has most of the species; Oregon, Nevada and Utah have some representatives; northern California is the home of the greater number. A few of the Brodiaëas are sometimes found in sandy soil. *B. terrestris* always is, *B. ixioides* occasionally and *B. laxa* in depauperate specimens. I have also received bulbs of some Brodiaëas unknown to me from the Sage-brush sand of Nevada and Utah. *B. capitata* and *B. (Brevoortia) coccinea* luxuriate in the débris

of loose rock and mould on the hill-sides, and the remaining species are natives of clay soils from light to heavy; *B. stellaris*, *B. congesta*, *B. multiflora* in lighter, and *B. grandiflora*, *B. minor*, *B. laxa*, *B. ixioides* and *B. lactea* on rich clay or "wash" soils. *B. peduncularis* is found in the sand and mould in the beds and along the sides of living streams. All Brodiaëas are lovers of water, while the last named species grows in situations where water is standing or dropping continually during the winter. The finest growth of *B. grandiflora* or *B. ixioides* I have ever seen was where winter streams broke over ledges of large loose rocks. The bulbs were in the rich mould in the interstices and catches, and subject to a drip of water until the blooming season, and after that became dry. On the sunny sides of the deep precipitous cañons, where the loose soil rock and leaves have slid down to the bottom of the slope, often growing on low underbrush, which its flower-stalks overtop, *B. coccinea*, the Vegetable Fire Cracker, grows most luxuriantly. In such situations stalks five feet high, and bearing from fifteen to thirty blossoms, are not unusual. *B. capitata* delights in similar soil, but in a sunny exposure. *Stropholirion Californicum*, or *B. volubilis*, a singular species in which the flower-stalks twine around any supporting object, delights in a soil like that suited to *B. capitata* in underbrush.

So much for natural conditions. I have perfect success with Brodiaëas in shallow boxes, the same as described for Calochortus. For a covering I use clay and chip soil. With *B. grandiflora*, *B. capitata*, *B. coccinea* and *B. stellaris* rich soil scraped from a wood-yard proves excellent covering. With others, clay loam, with various mixtures, with chip soil, have been tried, and the bulbs thrive in all of them. In boxes one will hardly use too much water until the blooming season, when moderate moisture only is required, after which the plants should be dried off. They should be planted shallow—four inches is deep enough—and they need abundant sunlight. Here all are perfectly hardy, and I am satisfied that with slight winter protection they will prove so in the eastern states.

Ukiah, Cal.

Carl Purdy.

Hardy Plant Notes.

UNTIL the end of November *Trollius Europæus* and *T. Asiaticus* were both flowering and maturing seed in the open border, a fact which should be noted. A perfectly hardy plant that produces useful cut flowers for seven months in the open border, and that only requires a moist soil to make it succeed perfectly, stands a good chance of becoming popular if merit commands success. There is another *Trollius* that is a good garden plant, but its flowering season is short. This is *T. Japonicus*, the flowers of which are of a bright orange and most distinct. Its season of flowering is in early summer along with our native *T. laxus*, which is the *T. Americanus* of European lists and gardens, though it is a pity the name, *T. Americanus*, does not possess priority, since we have *T. Europæus*, *T. Asiaticus*, *T. Japonicus* and *T. Caucasicus*. The *T. laxus* has very little to recommend it as a garden plant. It also has a very short flowering season and then dies down until spring again. There is said to be a white form which occurs rarely, but I have never seen it and cannot say anything as to its merits. *Trollius Europæus* and *T. Asiaticus* are very similar in many respects, the principal distinction to an unbotanical eye being that while *T. Asiaticus* has stems usually unbranched, those of *T. Europæus* are often branched, with several flowers to a stem. The easiest way to get up a stock of *Trollius* is from seed, which must be sown at once so that it may be treated to a good freezing in a cold frame. Every seed will come up in spring, but if not subjected to the freezing seeds of this genus will remain dormant for years, as I have proved several times.

Delphinium Zalil is a most distinct yellow Larkspur. I had well nigh given up in despair of ever having living plants from seed, when I happened upon a fine lot of plants that were raised from seeds in a Massachusetts garden, and this set me thinking, and, thanks to Herr Max Leichtlin, I am now the fortunate possessor of a fine lot of plants raised from seed that germinated in three weeks from the time of sowing. We learn from Herr Leichtlin that seeds of this plant, if not sown at once after being gathered, take a long time to germinate. Seeds of this description, even if they possess vitality when sown, have to run many chances before they germinate. What with overwatering, or the reverse, the washing over of seeds, the growth of moss on the surface of seed-pans, but few seeds germinate, and snails or slugs, with their unerring instinct for pans that contain the choicest plants, often make short work of these; and a season's watching and care are lost. It appears that Monsieur Benary, of Erfurt, has purchased the stock of Herr

Leichtlin's seed, and those who wish to try again should do so through this source. This Larkspur is hardy in Massachusetts, but whether a perennial or biennial has not yet been stated decisively.

It is a matter of surprise to me that American dealers in hardy plants have not yet taken in hand *Phygellus Capensis*. This fine plant is hardy in Britain, where it is common in gardens, as also in other parts of Europe, where it can be obtained easily, and the plant is of the kind that travels well. Inability to endure transportation is a serious obstacle to the introduction of many beautiful plants that are rare in gardens simply for this cause. *Onosma Taurica* is a fair example of this. I was much pleased recently to meet with *Phygellus Capensis*, and to learn that it is hardy in this state with a little protection. It was thriving and flowering freely alongside of *Passiflora incarnata*. *Phygellus Capensis* grows about three feet high. One-half of the plant's stature goes to form a large-branched panicle of bright scarlet flowers, resembling somewhat those of *Pentstemon Torreyi*, and, in a word, the plant has all the merits of this *Pentstemon* without its one fault—namely, a tall habit compared with the strength of its flowering shoots. This *Phygellus* propagates readily from cuttings, and seeds are said to germinate readily also, but such has not been my experience, though it may have been that the seeds had lost their germinating power. However, cuttings root readily in about three weeks, and this may possibly be the best way to increase the plant. Even should this plant not prove hardy, it is a desirable one on account of its long flowering season, which lasts nearly all summer. While one possesses but a limited number of these plants it would be perhaps better to lift and store them in a cellar or other suitable place until their hardiness in particularly cold localities has been tested and satisfactorily proved.

South Lancaster, Mass.

E. O. Orpet.

The Forest.

Some Vermont Forests.

THE numerous stumps of large Pine-trees and long stretches of stump fences still remaining in many portions of Vermont testify to an original supply of fine timber, such as exists now, if at all, in very small patches. The coniferous trees which are used for lumber—Spruce, Pine and Hemlock—are fast disappearing. Indeed, the fine first growth of Pine timber is already a thing of the past here. Among the mountains remote from railroads some fine Spruce lumber is still standing, but even in these retreats great inroads are being made. One needs only to compare the condition of a few such localities in their present condition with what they were ten or twelve years ago to comprehend what is going on. Twelve years ago the Spruce timber in the immediate vicinity of Mount Mansfield had not been touched, or at least only on its outskirts. On both sides of this grand mountain noble forests were standing. On the Stowe side, between the north end of Mansfield and Mount Sterling, which lies to the east, is what is called Smugglers' Notch—a wild cut between the two mountains on both sides of which are high jagged cliffs. Under and among these may be found flourishing in their season such rare boreal and alpine plants as have tempted many botanists to make long journeys to this spot for the purpose of seeing and collecting them in their natural home. At that time the road to this notch from the south led through nearly four miles of unbroken woods. The mountain slopes on both sides were covered with timber, a large part of which was fine first-growth Spruce. The carriage road leading to the summit of Mount Mansfield from the Stowe side also passed through much good timber. Several miles south of Mansfield is what is called Nebraska Notch, another wild pass through the mountain chain, with bare cliffs on the north and a sloping forest south. For miles east of this stretched a dark Spruce forest, perhaps as fine as the Green Mountains could afford.

Ten years have destroyed much of the beauty of these localities. A steam mill, located near the south end of Smugglers' Notch, has wrought much of this destruction; but on both sides of the mountain well up toward the summit, or as far as the timber of marketable size extends, and eastward of the Nebraska Notch, the Spruce-timber large enough for use has been cut, and much of it at a very small profit I am told. This seems probable, for it is fifteen miles to the nearest railroad station from most of it.

Another interesting locality was at Willoughby Lake. Here was a beautiful sheet of water, pure and cool, between two mountains, with its shores, especially on the west, embraced by a fine first growth timber. There was a remoteness and seclusion about this place that seemed to defy intrusion. This

was the condition of Willoughby in 1878. Since that time the woods have been invaded, the little lake turned into a mill-pond, and the stamp of general desolation which lumbermen usually leave behind them is written on nearly every feature of this once beautiful spot.

The same thing is going on in other portions of the state. The large steam mill at North Stratford, New Hampshire, is fed, I believe, from the forests of north-eastern Vermont. The large quantities of saw-logs which in their season cover the Connecticut River above Wells River do not all come from New Hampshire.

The time is not far distant when Vermont will hardly be able to show within her borders a fair sample of her once abundant mountain forests.

Southwick, Mass.

F. H. Horsford.

Correspondence.

The Nomenclature of American Grapes.

To the Editor of GARDEN AND FOREST :

Sir.—I send you the result of some inquiries concerning Vahlenberg's *V. palmata* which seems to settle in this country (it has already been settled in France, where American Grapes are most diligently studied) the dispute as to which name should be used, *V. rubra*, Mx., or *V. palmata*, Vahl., to designate the species of Grape which was rediscovered by H. Eggert on the Mississippi River above St. Louis in 1882, and which Dr. Engelmann, in the Bushberg Catalogue, 1883, claimed to identify as Vahl's *V. palmata*, which he so classified, and which was illustrated for the first time in the July, 1889, GARDEN AND FOREST, under Engelmann's name, *V. palmata*.

In the January number, 1884, of *La Vigne Américaine*, published in France, J. E. Planchon, referring to Engelmann's use of *V. palmata*, reviewed all the evidence then at command bearing upon the subject (pages 15-20). I make here a few extracts from Planchon's article: "Sous le nom de *Vitis palmata*, le botaniste danois Vahl. a décrit, en 1794, dans ses *Symbolæ botanicæ* (3^e partie, p. 42), une vigne qu'il avait reçue du Jardin des Plantes de Paris et à laquelle il consacre l'article suivant que je traduis du latin en français," etc. After Vahl's description as translated by Planchon the latter remarks: "Une description aussi incomplète, ne comprenant ni les fleurs, ni le fruit, devait laisser des doutes sur la détermination de cette plante. Aussi l'a-t-on rapportée souvent comme synonyme à d'autres espèces, par exemple au *Riparia* de Michaux, à l'*Estivalis* du même auteur, ou même au *Labrusca* de Linné."

From the above it appears that Vahlenberg obtained the plant he described so incompletely from the Jardin des Plantes in Paris. This plant it appears had several synonyms, such as *V. Virginiana*, *V. Virginica* and *V. Virginensis* (see Planchon's article, pp. 16 and 17). Finally, in summing up the whole matter, Planchon says (p. 20) that the evidence "me confirme tout à fait dans l'idée que le *Vitis rubra*, Michaux, est distinct du *Palmata*, Vahl."

This decision from such an eminent ampelographer as J. E. Planchon should of itself be sufficient; but to make doubly certain, I wrote to Professor Pierre Viala, who was for years associated with Planchon, who three years ago visited this country on a special commission from the French government to investigate the native Grapes of the United States, who since that time has published the completest works upon our species extant, and who this year spent six months in Paris as a specialist in Viticulture for the French government to investigate the plant in question, in the Garden of Plants, Paris, and let me know whether it is the true *V. rubra* of Michaux or not; and here is his reply, dated November 11th, 1890:

"Le *V. palmata* de Vahlenberg du Jardin des Plantes de Paris est un *V. riparia*, et non le vrai *V. rubra*, de Michaux."

Hence we have in synonymy *V. rubra*, Mx.; Syn., *V. palmata*, Englund, Bushberg Catlg., 1883, and GARDEN AND FOREST, July, 1889; *V. riparia*, Mx.; Syn., *V. palmata*, Vahl. So *V. palmata* must not be used except as a synonym.

It will be remembered that in an article of mine published in GARDEN AND FOREST for October 1st *V. palmata* was substituted where I had written *V. rubra*.

Denison, Texas.

T. V. Munson.

[The question raised is one as to the weight of authorities. Dr. Engelmann, a very careful student, had no doubt that Michaux's *Vitis rubra* was identical with the older *V. palmata* of Vahl (not Vahlenberg). Planchon, on the other hand, thought that he had reason to believe that Vahl's plant was a form of *V. riparia*. We have never seen the

article quoted by Mr. Munson, but Planchon, in his revision of the order in De Candolle's "Monographiæ," makes *V. palmata*, Vahl, a variety of *V. riparia*, and while he keeps *V. rubra* distinct, he expresses a strong doubt whether it is anything more than another variety of the same species. Viala, of course, follows Planchon. Whether *V. cordifolia*, *V. riparia* and *V. rubra* should not all be grouped in one species is a matter to be determined by future study in the field by skilled systematists. This, however, does not touch the question in point, which is simply whose judgment ought to be followed, that of Engelmann or Planchon, as to the identity of Michaux's species with Vahl's *V. palmata*. We have preferred to follow Dr. Engelmann.—Ed.]

Clematis Paniculata.

To the Editor of GARDEN AND FOREST :

Sir.—Allow me to add one more note to those which have already appeared in GARDEN AND FOREST as to the beauty and value of this species, and it cannot be too highly commended, as probably the best of the small white flowered kinds. A grafted plant of mine has made a growth of ten feet this season, with numerous shoots which in early September were topped with long garlands of dainty, fragrant flowers borne in great profusion. But what is perhaps the most interesting phase of the plant does not seem to have been insisted on as it deserves, namely, its beauty in early winter. Its thick, leathery leaves proved to be very persistent, and in early November commenced to be touched with bright red and coppery tints, which, as the season advanced, changed to deeper ones, and now, in mid-December, the vine is a mass of dull bronze, over which hover gracefully a profusion of seeds of a deep, clear red, each furnished with a feathery tuft. The scarcity of foliage in the garden at this dull season makes valuable any plant with persistent foliage, even if of no value during the summer; but here we have a plant attractive in every season, and of very peculiar beauty, when most other things have entirely disappeared.

Elizabeth, N. J.

J. N. G.

Recent Publications.

We have been favored with advance sheets of portions of the *Report of the Pennsylvania State Board of Agriculture*. The report of the Botanist, Mr. Thomas Meehan, is always interesting, and from it we take the following extract:

The correspondence of this Department has been for the most part confined to answering inquiries as to the names of plants—some of them being of weeds that have for the first time attracted attention. None of these have, however, been new to the state; nor does it appear that any noxious weeds are spreading more than usual. Inquiries are sometimes made as to the best method of destroying troublesome weeds. No plant can live if it is not permitted to make green leaves. If the land is full of something troublesome there is nothing better than to put it in Corn, and insist on continuous culture—not leaving the work till the weed to be destroyed has thrown out strong green leaves, but before it has had the chance to make any. Occasionally reports come to the Botanist that weeds were not killed by this process. Failure could only come from neglect to hoe or cultivate until the weed enemy has made some strong green leaves. It is a good lesson for a young farmer to give him some stubborn weed-plant—a Canada Thistle or Horse-nettle, for instance—and let him try the experiment.

In like manner it is wholly healthy foliage that will give full crops. Whenever grain loses its leaves before the ears mature the crop is lessened. An excellent lesson can be had from two hills of Corn. Commence to denude the plant of foliage before the silk or tassel forms, and watch the result on the crop. Even those who believe they understand the value of attention to these matters will be surprised with the force of lessons like these.

It has recently been placed beyond all doubt that the continual injury to the foliage of the Strawberry by the work of a Fungus, which spots the leaves, is what proves the continual degeneracy of varieties. The hundreds of new varieties of Strawberries that have been introduced during the past quarter of a century have not given us in any respect better kinds than we then had, but they take the place of kinds that degenerate. When half the leaf-blades are destroyed by the spot, the plant has only half the leaf surface it should have, and suf-

fers proportionately. New seedlings are usually several years old before they get the spot. The Sharpless is said to have resisted the attack longer than any other. The methods of culture, necessary though they be, lower vital power to resist the spot. It is said that the Strawberry in its wild state is able to resist the spot.

Another instance of the value of foliage is illustrated by the early fall of the leaf on the Pear or other trees, from the leaf Fungus, from caterpillars or from other causes. It is well known that the fruit will not then ripen well.

Perhaps one of the best illustrations is by the loss of leaves on the Potato-plant by the Colorado beetle, when all know no crop is returned to us.

It is impossible for a plant to continue long without healthy leaves. We can turn this principle to good account in the destruction of weeds, and to good account also by doing all we can to keep the foliage healthy in the crops we grow.

Professor N. L. Britton, of Columbia College, has recently reprinted from the *Annals of the New York Academy of Science* his "List of the State and Local Floras of the United States and British America." It forms a complete index of works relating to the geographical distribution of our plants, and includes the titles of 791 treatises although all such minor ones as isolated notes and "short lists of observations" have been excluded. The works are divided into four classes: Lists in which exact localities are not given, those giving stations, those in which the mention of stations notes or occasional descriptions are added, and descriptive lists properly so called. The order of arrangement is, however, by countries, states and counties, the class to which each work belongs being indicated by the annexed letter A, B, C or D. The earliest local list of American plants seems to have been John Bannister's "Catalogue of Plants," which relates to the large region then called Virginia and was issued in London in 1668. Next came another Virginian catalogue, published at Leyden by Johannes Clayton between 1739 and 1743. The plants of Orange County, New York, were described by Cadwallader Colden in 1749-1753, and in 1785 the Rev. M. Cutler, of Boston, published a list of New England plants. To-day 106 catalogues instruct us with regard to New England, while 121 refer to the middle states and the District of Columbia and sixty-six to the Pacific coast. These are the largest numbers attached to any of the districts into which Mr. Britton divides the continent, if we except British America, which, considered as a whole, furnishes 123 catalogues, with ten in addition that refer to the explorations of the Transcontinental Survey. But, of course, such division into districts is more or less arbitrary, and it is more interesting to note which individual states have been most diligently studied and described. New York heads the roll with sixty-five catalogues, then comes California with forty-eight, and then Massachusetts with forty-five, Pennsylvania with thirty and Ohio with twenty-eight. The labor involved in the preparation of this little bibliography must have been considerable, and it should meet with a grateful welcome not only from students bent upon personal improvement, but from librarians anxious to make the local departments of botanical libraries as complete as possible.

Horticulture in Canada.

Meeting of the Ontario Fruit Growers' Association.

AT the first session of the annual meeting of the Fruit Growers' Association of Ontario, held a fortnight ago, Mr. A. M. Smith, the retiring President, delivered an address from which we make the following extracts:

Within twenty years the membership of the Society has grown from 30 to 2,100, so that it is now the largest body devoted to horticulture in America and perhaps the largest in the world. Thirty years ago berries were brought to market in pans and pails dipped out with hands or ladles into measures as buyers called for them, and, as a consequence, they were delivered mostly in the form of jam. Apples, pears and even peaches, when not too soft, were marketed in grain-sacks, jolted over rough roads in lumber-wagons, instead of being shipped as all kinds of fruit now are with careful handling and in attractive packages.

Notwithstanding the discouragements of the year the fruit crops on the whole have been as successful as any of the agricultural crops. This season has proved that it is not wise for one whose income is from fruit to depend altogether on one kind. Those who have taken their chances with apples or peaches alone find themselves in a bad position, while those

who have raised many kinds of fruits have found something to fall back upon. Many members of our Association have been doing good work this year by visiting various farmers' institutes and taking part in discussions on horticultural topics and imparting whatever information they could, relating to fruit growing. This is a patriotic and philanthropic work and it should be encouraged.

At the general Fruit Growers' Convention held during the year agents of the various transportation companies were present and gave an attentive hearing to our suggestions and grievances. They manifested a desire to furnish us with better facilities and greater dispatch in shipping fruits, and since the meeting there has been an improvement in this matter. Express companies, however, do not furnish proper accommodations, because they should have shelves in their cars on which to store the fruit, instead of piling the light baskets upon one another in such a way that the fruit is in very bad condition when it reaches the consumer. The pilfering of fruit from baskets and other packages in transport has reached annoying proportions. Almost every shipper is at some time accused of giving short weight or measure, the reason being that after the packages have been shipped they are broken into on the road and a considerable fraction of the fruit abstracted by employes or their friends. The loss is small in each case, so that the shipper does not care to report it, and if he does he gets no satisfaction; but in the aggregate it amounts to a serious tax upon the growers. There is no reason why fruit should not be as safe in a basket in the charge of an express company as money or any other article of value. We have hopes of checking this evil, because we find that transportation companies feel inclined to listen to our united demands; and this is one of the great values of such an organization.

Notwithstanding the advanced position of fruit-growing in this province, it is a fact that not one farmer in ten produces half enough for his own use, and this is true of even the most prosperous ones. It is surprising that in thriving agricultural communities there is so little horticultural taste and knowledge even where there are good buildings, blooded live stock and fine crops; we see no orchards, no small fruits, no flowers, no ornamental planting, and if there is any, it is in such a neglected state that it emphasizes the fact that horticulture is an unappreciated art. Perhaps a diet in which fruit formed a larger proportion would give us a more healthy set of men than one in which fat pork abounds, and if farmers would take a keener interest in surrounding their homes with beauty they would have less complaint to make of their children for emigrating to other countries and engaging in other pursuits.

Professor Saunders is doing a great work in producing new varieties of fruits adapted to the colder portions of our country, and his experiments in hybridizing Strawberries, Raspberries, Gooseberries, Currants and other fruits will prove of great benefit. I saw some of the results of his labors, in testing not a few, but hundreds of varieties of Raspberries, during their season, which had been produced by hybridizing and careful selecting.

Mr. Pettit, in a strong speech, urged that if the foreign fruit trade was to be made profitable, there should be certain market days at centres of traffic where the products of the grower could be disposed of directly to the buyer, and subject to inspection by an officer of the Government, as is the case with cattle, grain, etc. It is essential that grades of fruit should be established, so that a Government brand upon a package of apples or other fruit marked Number one should mean that it was of fair size and color, free from scab and worms, and packed properly in packages of standard size. In the same way grade Number two should have a specific meaning, and in all cases it should be understood that fruit for export should be properly packed. A few consignments of fruit in bad order gives a prejudice against the entire output of the region from which it came. Even where growers are honest in packing their fruits, if there is no standard there will be no evenness of quality, and nothing but strict rules, thorough inspection and accurate grading will give the buyer any guarantee or the grower any assurance that his Number one fruit is not a different article from the Number one fruit of his neighbor. After some discussion the following resolution was passed: Resolved, That we deem it the best interest of the fruit-growers, shippers and consumers, as well as the good name of our country, that a standard of excellence be established for such fruits as are shipped in barrels and other closed packages into the markets of our cities and towns and for transportation to foreign countries, and the Government is hereby petitioned to appoint proper inspectors for that purpose.

Professor Craig, in speaking of the method of the propaga-

tion of fruit-trees, said that while fruit-growers are busily engaged in looking for new varieties, few of them are studying how to improve old methods of propagating the varieties we have, or investigating the effect of the different modes of propagation upon the health and longevity of the subjects. That a tree makes a vigorous growth for three years in a nursery-row is no proof that it will make a valuable orchard-tree, and the reason is not always that the soil and climate are uncongenial. We should know whether the cion is married into a congenial family. The practice of grafting on pieces of roots, which originated in 1811 with Andrew Knight, has introduced many knotty problems into pomology which are still far from solution. Trees grafted on piece-roots allow of deep setting and encourage roots from the cion, and it would therefore seem that in warm climates, where there is no such thing as root-killing, budded trees would be more satisfactory; but in cold climates the piece-roots serve an indispensable purpose where hardness is desired, because they allow the use of the deeply set cion. In this way the piece-roots serve only a temporary purpose, while the cion represents a variety of known hardness. Seedling stock is variable, and only an occasional tree will prove sufficiently hardy to withstand severe climates. Good trees for all purposes can be obtained by using only the first and second cuts from the root, and these should be not less than three and a half inches in length, and the cion between five and six inches.

Pear-trees are almost always propagated by budding, but some firms in the United States are making a specialty of crown grafting on the whole roots. Russian varieties treated in this way and planted eight years ago on the farm of the late Mr. Charles Gibb are now making vigorous growth.

In a recent bulletin, Professor Budd, in discussing the stock for Cherries, mentions the Wild Red Cherries, *Prunus Pennsylvanica* and *Prunus pumila*, as two promising stocks. Of the first, he says that "it has been found that it unites perfectly with all varieties tried on Morellos, Dukes and Heart Cherries, either by grafting or budding. It sprouts, but when top-worked with vigorous sorts it does not appear to have any reserve material to waste in sprouts." Of the second Cherry, he says "as yet its use is experimental, but it unites well with all hardy sorts in budding, and it does not dwarf the parts worked upon it to a greater extent during the first five years than does the Mahaleb." I have tried both these stocks in a small way, but have not been sufficiently successful yet to justify my advocating their use.

In propagating the Plum the same objection to the Myrobalan stock can be urged as in the case of tender stocks for Pears and Apples. The native Plum of the east cannot be recommended, as it is affected by the Black Knot and it grows slowly. The western forms of the same species have not these defects and they unite well when budded or grafted with the Plum, the Peach and the Apricot. These western Plums grow readily from pits, and make large enough stock for budding in August of the same year they are planted. The art of grafting is of immense service, but I have little doubt that trees on their own roots would be, as a rule, less liable to disease.

The best and simplest protection for Roses in winter, according to Mr. James Webster, of Hamilton, has been found to be the mounding up of earth to the height of ten inches about the plant. This mound is removed in the spring when danger of frost is passed, and then the pruning is done. Not more than six or eight inches of wood is left on the strongest Roses, while from the less vigorous ones the weakest shoots are taken away entirely. The wood cut off in pruning is immediately burned, as by this means the thrips and insects which leave eggs in the wood to pass the winter are kept down.

In regard to the use of wood-ashes in orchards, Professor James, of the Guelph Experimental Station, said a fruit-tree makes three demands upon the soil—(1) for the wood, (2) for the leaves, (3) for the fruit. Ashes contain the elements which a tree uses to form healthy wood, and therefore they are useful as a fertilizer for this purpose. Leaves, by the time they fall, have returned their best parts to the tree; but still some loss occurs where the leaves are blown away. In the fruit the orchard sustains its loss mainly, and if we know the constituent parts of this we can tell just what elements are needed. Potash is the largest ash-element in all fruits, and therefore the best fertilizer will contain potash, and that is why wood-ashes are so valuable. Ashes, besides, have some phosphoric acid and lime elements which help to raise their value up to twenty or twenty-five cents a bushel, but when ashes can be had at ten cents a bushel they are the cheapest fertilizer that can be obtained. A complete fertilizer for an acre of orchard would be forty bushels of ashes, 100 pounds of crushed bone and 100 pounds of sulphate of ammonia.

To the question, Does it pay to prune Plum-trees? Mr. Willard answered that for some years he had been in the habit of cutting off from one-half to one-third of the season's growth during the mild weather in the winter when the wood was not frozen hard, and he was well satisfied that it was profitable. On varieties which make a long, rampant growth there is much breakage when the limbs are set full of fruit. By cutting back, short branches are forced out, which gives more fruiting surface and a stronger tree. He does not prune after the trees have begun to grow.

Notes.

The *Eschscholtzia* has been chosen as California's state flower.

The Proceedings of the eleventh annual meeting of the Society for the Promotion of Agricultural Science, held at Indianapolis, make a pamphlet of 125 pages. By the constitution of this association the number of its members can never exceed fifty, but these are the leading investigators in this country in the various sciences related to agriculture. This report contains the latest fruits of study and experiment in this wide field.

Secretary Woolverton, of the Ontario Fruit-Growers' Association, reported at the late meeting of that body that Mr. E. D. Arnaud, of Annapolis, had sent him samples of the fruit of a Cherry-tree which had been picked in September. The fruit is about the size and shape of the Kentish, and of a deep red color when ripe. It has firm flesh and agreeable flavor and bears transportation well. We should be glad to know more of this late-blooming Cherry, which is called the Clark.

Mr. Felix Oswald, writing of southern Mexico in the *Open Court*, says that "on the markets of Vera Cruz and Tampico vegetable products sufficient to support a family of five persons for a day can be bought for one real (twelve cents)." As meat, food and warm clothing are not required in that climate, and as "from the coast up to an elevation of 4,000 feet fuel for the purposes of house warming can be dispensed with for eleven months in the year," it is easy to understand that laborers can support a family on wages which, in northern lands, would not suffice to keep them individually from starvation.

The *Bulletin of the Torrey Botanical Club* for December, 1890, says: "After an absence of two years in South America, during which time he has collected a very large and valuable representation of the plants of that region, Dr. Morong has returned in health and safety. All botanists will bid him cordial welcome, both on his safe return and his entry upon a new sphere of usefulness and activity. The trustees of Columbia College have appointed him to be Curator of their herbarium, a position which has not been occupied since the death of Mr. P. V. LeRoy. In this appointment an important step has been made in the progress of American systematic botany."

Many persons must have wondered at the meaning of the word "*ha-ha*," still often used in England for a sunken fosse. Walpole's explanation is that when dividing walls were first abandoned, together with many other devices of the formal style of gardening, and ditches were substituted, the attempt "was then deemed so astonishing that the common people called them *Ha! Ha!* to express their surprise at finding a sudden and unperceived check to their walks." Modern dictionaries assert that the word is a mere reduplication of *haw*, a hedge, and can be written *haw-haw* or *ha-ha*. As the *ha-ha* is, however, a ditch not bordered by a hedge, but designed to be invisible, this derivation seems as unsatisfactory as Walpole's seems far-fetched.

Young Bamboo shoots, when tender, are eaten as a pot-herb, and to preserve their tenderness they are covered over with earthen pots to blanch them. That this food was in use among the ancient Aryans is evident from the prohibitions of eating the same by the three upper classes of the Hindoos. Green Bamboo shoots are used by the Nepaulese very generally as a pickle, which they prepare by cutting the shoot into small slices and steeping the same in water in a close earthen jar, where they ferment and generate a sort of acetic acid. This preparation is called *Tambi* in Nepaul. It is a favorite pickle both of the rich and poor, and pieces of the Nepaulese round Capsicums, called *Khorasani*, are thrown into the same.

A correspondent of *The North-western Lumberman* calls attention to the interesting fact that about seven-eighths of all the

spools used in the world are produced in Maine and New Hampshire, or are made from lumber manufactured and shipped from those states. Millions of feet are sent every year to the great thread works of J. & P. Coats at Paisley, Scotland, the greatest establishment of its kind in the world, alone. No material for a spool has yet been found as good as the wood of the Canoe Birch. Attempts have been made to make spools of glass and from wood-pulp, but they have not proved successful. A few years ago Birch-land was considered almost worthless in northern New England; now it is held at as high prices, when situated near railroads, as Pine-land. The extension of the Canadian Pacific Railroad into northern Maine is said to have brought a large amount of Birch-timber within easy access of the mills.

The Report of the annual meeting of American Cemetery Superintendents at Boston last August contains much that is of permanent value. A sketch of the life of Adolph Strauch, by Mr. Eurich, of Toledo, is a deserved tribute to the man who originated the so-called "Lawn-System" which has done so much to encourage what is natural in the planning and planting of cemeteries. The essay by Mr. G. Troup, of Buffalo, on cemetery roadways is worthy of study by every one who is interested in road-construction. Mr. Simonds, Superintendent of Graceland Cemetery, in Chicago, read a paper on the trees and shrubs which have proved most valuable in that climate; and Mr. A. W. Blaine, of Detroit, in discussing "Mistakes in Cemeteries," touched upon many common errors in design and maintenance. It is a misfortune that the essay of Mr. J. G. Barker, of Forest Hills Cemetery, Jamaica Plain, which was distributed at this meeting, could not have been included in the Report. Mr. Barker's paper was read before the Massachusetts Horticultural Society, and it contains descriptions of several of the most interesting cemeteries of the country.

The ugly and dilapidated board fence which has surrounded Mount Morris Park, in Harlem, is being torn down, and will be replaced by a fine retaining wall of stone, surmounted by an iron railing. The improvement was desirable, for, although almost unknown to inhabitants of the lower parts of our city, this is certainly the prettiest of all the small parks in New York, and is very probably the most individual park of its size in the world. About two-thirds of its area (which includes two city blocks) is level ground, charmingly laid out with wide lawns, unbroken by cross paths, and with encircling walks flanked by good trees and beautiful groups of shrubs. But in the south-east corner of the park the ground rises suddenly to form a rocky hill higher than the tops of the surrounding houses, which is covered with great old trees, chiefly Oaks. Such an isolated hill rising amid streets which are perfectly level, is a most unexpected feature to find in the heart of a great city, and its harmonious contrast with the flat lawns around it is extremely picturesque. We advise our city readers to use one of the first days when the trees next begin to bud for an excursion to Mount Morris Park, certain that they will feel themselves rewarded, and will wonder why its singularity and beauty are not matters of more general knowledge.

A writer in the *Bulletin of the Torrey Botanical Club*, reviewing Dr. Schweinfurth's recently published work called "*Sur certains Rapports entre l'Arabie Heureuse et l'ancienne Egypte*," the conclusions of which are based on an Arabian journey during which the author collected 920 species of plants, cites the following interesting facts: "The ancient Egyptians cultivated certain trees, dedicated to certain divinities, and among them were the *Persea* of the ancient Greeks (*Mimusops Schimperii*) and the Sycamore; the leaves and fruit of both trees having been frequently found in ancient tombs, where they had been deposited as offerings. The '*Persea*' (not to be confounded with *Persea gratissima*, Gaertn.) has for centuries disappeared from Egypt, but the Sycamore is still found there in large quantities, though only in cultivation. The region of the Upper Nile, rich as it is in Fig-tree species having characteristics that bring them into close relation to the Sycamore, has not as yet shown any in a wild state that might be considered its ancestor. Dr. Schweinfurth gathering from Forskal's notes that in Arabia were to be found species allied to the Egyptian Sycamore, was especially interested in searching for them, and learned that the Fig-tree known as '*Chanès*' in the mountains and as '*Bourra*' on the plains, is identical with the Egyptian tree which incontestably has its origin there. He also found the '*Persea*' growing wild and called '*Lebbakh*,' a term used by the Arab geographers of the middle ages, and which to-day in Egypt is applied to an *Acacia* introduced from India (*Albizia Lebbek*), and which is now, as '*Lebbakh*,' a widespread road-side tree."

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